



**US Army Corps
of Engineers®**
New England District

W912WJ-05-B-0015

Maintenance Dredging 6-Foot Federal Navigation Channel

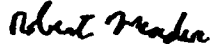
Cocheco River
Dover, New Hampshire

Construction Solicitation And Specifications

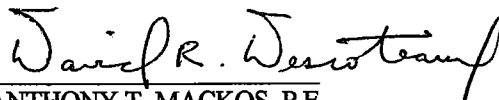
August 2005

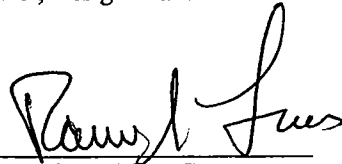
Maintenance Dredging
6-Foot Channel
Cocheco River
Dover, NH

DESIGN AUTHENTICATION



ROBERT MEADER P.E.
Technical Lead

for 
ANTHONY T. MACKOS, P.E.
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This project was designed for/by the New England District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER1110-1-8152.

SOLICITATION, OFFER, AND AWARD (Continued)*(Construction, Alteration, or Repair)***OFFER (Must be fully completed by offeror)**

14. NAME AND ADDRESS OF OFFEROR <i>(Include ZIP Code)</i>		15. TELEPHONE NO. <i>(Include area code)</i>
		16. REMITTANCE ADDRESS <i>(Include only if different than Item 14)</i> See Item 14
CODE	FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. *(Insert any number equal to or greater than the minimum requirements stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS	SEE SCHEDULE OF PRICES
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18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS*(The offeror acknowledges receipt of amendments to the solicitation -- give number and date of each)*

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER <i>(Type or print)</i>	20B. SIGNATURE	20C. OFFER DATE
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AWARD (To be completed by Government)

21. ITEMS ACCEPTED:	
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22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA
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24. SUBMIT INVOICES TO ADDRESS SHOWN IN <i>(4 copies unless otherwise specified)</i>	ITEM	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <input type="checkbox"/> 10 U.S.C. 2304(c) <input type="checkbox"/> 41 U.S.C. 253(c)
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26. ADMINISTERED BY CODE	27. PAYMENT WILL BE MADE BY: CODE
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CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

<input type="checkbox"/> 28. NEGOTIATED AGREEMENT <i>(Contractor is required to sign this document and return _____ copies to issuing office.)</i> Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications or incorporated by reference in or attached to this contract.	<input type="checkbox"/> 29. AWARD <i>(Contractor is not required to sign this document.)</i> Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.
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30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN <i>(Type or print)</i>		31A. NAME OF CONTRACTING OFFICER <i>(Type or print)</i>	
30B. SIGNATURE	30C. DATE	TEL: _____ EMAIL: _____	
		31B. UNITED STATES OF AMERICA BY	31C. AWARD DATE

Section 00010 - Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001		1	Lump Sum	N/A	\$_____
	MOBILIZATION AND DEMOBILIZATION FOR DREDGING OPERATIONS				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002		1	Lump Sum	N/A	\$_____
	MOBILIZATION AND DEMOBILIZATION FOR ROCK REMOVAL OPERATIONS				

ITEM NO	SUPPLIES/SERVICES
0003	DREDGING AND DISPOSAL, MECHANICAL; MATERIAL FROM FEDERAL CHANNEL

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003AA		10,100	Cubic Yard	\$_____	\$_____
	FIRST 10,100 CY				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003AB		23,500	Cubic Yard	\$_____	\$_____
	OVER 10,100 CY				

ITEM NO SUPPLIES/SERVICES
0004 ROCK REMOVAL

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004AA		260	Cubic Yard	\$ _____	\$ _____
	FIRST 260 CY				—

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004AB		480	Cubic Yard	\$ _____	\$ _____
	OVER 260 CY				—

NOTE:

Item Numbers 0003 and 0004 are subdivided into two estimated quantities and are to be separately priced. The Government will evaluate each of these items on the basis of the total price of its sub-items. See CONTRACT REQUIREMENTS, Clause “VARIATIONS IN ESTIMATED QUANTITIES – SUBDIVIDED ITEMS (EFAR 52.212-5001)”.

Section 00100 - Bidding Schedule/Instructions to Bidders

CLAUSES INCORPORATED BY REFERENCE

52.214-3	Amendments To Invitations For Bids	DEC 1989
52.214-4	False Statements In Bids	APR 1984
52.214-5	Submission Of Bids	MAR 1997
52.214-6	Explanation To Prospective Bidders	APR 1984
52.214-7	Late Submissions, Modifications, and Withdrawals of Bids	NOV 1999
52.214-18	Preparation of Bids-Construction	APR 1984
52.214-19	Contract Award-Sealed Bidding-Construction	AUG 1996
52.225-10	Notice of Buy American Act Requirement--Construction Materials	MAY 2002
52.232-38	Submission of Electronic Funds Transfer Information with Offer	MAY 1999

CLAUSES INCORPORATED BY FULL TEXT

52.003-4002 BIDS RECEIVING DESK

Bids, if submitted in person or by messenger, shall be delivered to the Bids Receiving Desk (so identified), Building 1, Contracts Branch, Contracting Division, at the above address, prior to the time fixed for opening of bids. Bidders who attend the bid opening may deliver bids directly to the Contracting Officer in the New Hampshire Conference Room.

52.003-4014 INQUIRIES

Telephone inquiries relating to this solicitation should be directed as follows:

New England District, Corps of Engineers
 Procurement of Plans and Specifications,
 Prospective Bidders List, Bid Results,
 and Award Information 978-318-8420

Technical Inquiries on Plans and
 Specifications 978-318-8249

52.003-4015 MAGNITUDE OF PROJECT

The estimated cost of the work is between \$1,000,000 and \$5,000,000.

52.003-4021 PLACE OF BID OPENING

Bids will be publicly opened at the appointed time at the U. S. Army Engineer District, New England, 696 Virginia Road, Concord, MA 01742-2751, in the New Hampshire Conference Room.

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a firm-fixed price contract resulting from this solicitation.

(End of clause)

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Contracting Officer, U.S. Army Corps of Engineer District, 696 Virginia Road, MA 01742-2751.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) Site visits may be arranged during normal duty hours by contacting:

Name: Jim Doucakis

Address: 696 Virginia Road, Concord, MA

Telephone: 978-318-8308

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

<http://farsite.hill.af.mil>

<http://www.hq.usace.army.mil/cepr/asp/library/efar.asp>

<http://acqnet.saalt.army.mil/LIBRARY>

(End of provision)

Section 00600 - Representations & Certifications

CLAUSES INCORPORATED BY FULL TEXT

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

Common parent, as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

Taxpayer Identification Number (TIN), as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

___ TIN:-----

___ TIN has been applied for.

___ TIN is not required because:

___ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

___ Offeror is an agency or instrumentality of a foreign government;

___ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

___ Sole proprietorship;

___ Partnership;

___ Corporate entity (not tax-exempt);

- ___ Corporate entity (tax-exempt);
- ___ Government entity (Federal, State, or local);
- ___ Foreign government;
- ___ International organization per 26 CFR 1.6049-4;
- ___ Other-----

(f) Common parent.

___ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

___ Name and TIN of common parent:

Name-----

TIN-----

(End of provision)

52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (JAN 2005)

(a)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (b) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (b) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

(___) Paragraph (b) applies.

(___) Paragraph (b) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(b) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website at <http://orca.bpn.gov>. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause	Title	Date	Change
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Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of Provision)

52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (OCT 2004)

(a) Definition. HUBZone small business concern, as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) Evaluation preference. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except--

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer.

These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) Waiver of evaluation preference. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

___ Offeror elects to waive the evaluation preference.

(d) Agreement. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

- (2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;
- (3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns; or
- (4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.
- (e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.
- (f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (SEP 2004)

(a) "Definitions."

As used in this provision --

(a) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for such acts of international terrorism. As of the date of this provision, terrorist countries subject to this provision include: Cuba, Iran, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means --

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

(b) "Prohibition on award."

In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary or, in the case of a subsidiary, the firm that owns the subsidiary, unless a waiver is granted by the Secretary of Defense.

(c) "Disclosure."

If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclose such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include --

- (1) Identification of each government holding a significant interest; and
- (2) A description of the significant interest held by each government.

(End of provision)

252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 2005)

(a) Definitions. As used in this provision--

- (1) Foreign person means any person (including any individual, partnership, corporation, or other form of association) other than a United States person.
- (2) United States means the 50 States, the District of Columbia, outlying areas, and the outer Continental Shelf as defined in 43 U.S.C. 1331.
- (3) United States person is defined in 50 U.S.C. App. 2415(2) and means--
 - (i) Any United States resident or national (other than an individual resident outside the United States who is employed by other than a United States person);
 - (ii) Any domestic concern (including any permanent domestic establishment of any foreign concern); and
 - (iii) Any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern that is controlled in fact by such domestic concern.

(b) Certification. If the offeror is a foreign person, the offeror certifies, by submission of an offer, that it--

- (1) Does not comply with the Secondary Arab Boycott of Israel; and
- (2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. 2407(a) prohibits a United States person from taking.

(End of provision)

252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term supplies is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) Representation. The Offeror represents that it:

____ (1) Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

____ (2) Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of provision)

Section 00700 - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUL 2004
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	APR 1984
52.203-7	Anti-Kickback Procedures	JUL 1995
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	JAN 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	JAN 1997
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	JUN 2003
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.204-7	Central Contractor Registration	OCT 2003
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	JAN 2005
52.211-18	Variation in Estimated Quantity	APR 1984
52.214-26	Audit and Records--Sealed Bidding	OCT 1997
52.214-27	Price Reduction for Defective Cost or Pricing Data - Modifications - Sealed Bidding	OCT 1997
52.214-28	Subcontracting Cost Or Pricing Data--Modifications--Sealed Bidding	OCT 1997
52.219-4	Notice of Price Evaluation Preference for HUBZone Small Business Concerns	OCT 2004
52.219-8	Utilization of Small Business Concerns	MAY 2004
52.219-9 Alt I	Small Business Subcontracting Plan (Jan 2002) Alternate I	OCT 2001
52.219-16	Liquidated Damages-Subcontracting Plan	JAN 1999
52.219-25	Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting	OCT 1999
52.222-3	Convict Labor	JUN 2003
52.222-4	Contract Work Hours and Safety Standards Act - Overtime Compensation	SEP 2000
52.222-6	Davis Bacon Act	FEB 1995
52.222-7	Withholding of Funds	FEB 1988
52.222-8	Payrolls and Basic Records	FEB 1988
52.222-9	Apprentices and Trainees	FEB 1988
52.222-10	Compliance with Copeland Act Requirements	FEB 1988
52.222-11	Subcontracts (Labor Standards)	FEB 1988
52.222-12	Contract Termination-Debarment	FEB 1988
52.222-13	Compliance with Davis-Bacon and Related Act Regulations.	FEB 1988
52.222-14	Disputes Concerning Labor Standards	FEB 1988
52.222-15	Certification of Eligibility	FEB 1988
52.222-21	Prohibition Of Segregated Facilities	FEB 1999
52.222-26	Equal Opportunity	APR 2002
52.222-27	Affirmative Action Compliance Requirements for Construction	FEB 1999
52.222-35	Equal Opportunity For Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans	DEC 2001
52.222-36	Affirmative Action For Workers With Disabilities	JUN 1998

52.222-37	Employment Reports On Special Disabled Veterans, Veterans Of The Vietnam Era, and Other Eligible Veterans	DEC 2001
52.223-6	Drug-Free Workplace	MAY 2001
52.223-14	Toxic Chemical Release Reporting	AUG 2003
52.225-13	Restrictions on Certain Foreign Purchases	MAR 2005
52.226-1	Utilization Of Indian Organizations And Indian-Owned Economic Enterprises	JUN 2000
52.227-1	Authorization and Consent	JUL 1995
52.227-2	Notice And Assistance Regarding Patent And Copyright Infringement	AUG 1996
52.227-4	Patent Indemnity-Construction Contracts	APR 1984
52.228-2	Additional Bond Security	OCT 1997
52.228-11	Pledges Of Assets	FEB 1992
52.228-12	Prospective Subcontractor Requests for Bonds	OCT 1995
52.228-13	Alternative Payment Protections	JUL 2000
52.228-14	Irrevocable Letter of Credit	DEC 1999
52.228-15	Performance and Payment Bonds--Construction	JUL 2000
52.229-3	Federal, State And Local Taxes	APR 2003
52.232-5	Payments under Fixed-Price Construction Contracts	SEP 2002
52.232-17	Interest	JUN 1996
52.232-23 Alt I	Assignment of Claims (Jan 1986) - Alternate I	APR 1984
52.232-25	Prompt Payment	OCT 2003
52.232-27	Prompt Payment for Construction Contracts	OCT 2003
52.232-33	Payment by Electronic Funds Transfer--Central Contractor Registration	OCT 2003
52.233-1	Disputes	JUL 2002
52.233-3	Protest After Award	AUG 1996
52.236-2	Differing Site Conditions	APR 1984
52.236-3	Site Investigation and Conditions Affecting the Work	APR 1984
52.236-4	Physical Data	APR 1984
52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984
52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984
52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-12	Cleaning Up	APR 1984
52.236-13	Accident Prevention	NOV 1991
52.236-15	Schedules for Construction Contracts	APR 1984
52.236-16 Alt I	Quantity Surveys (Apr 1984) - Alternate I	APR 1984
52.236-17	Layout of Work	APR 1984
52.236-21	Specifications and Drawings for Construction	FEB 1997
52.236-26	Preconstruction Conference	FEB 1995
52.242-13	Bankruptcy	JUL 1995
52.242-14	Suspension of Work	APR 1984
52.243-4	Changes	AUG 1987
52.244-6	Subcontracts for Commercial Items	DEC 2004
52.246-12	Inspection of Construction	AUG 1996
52.248-3	Value Engineering-Construction	FEB 2000
52.249-2 Alt I	Termination for Convenience of the Government (Fixed- Price) (May 2004) - Alternate I	SEP 1996

52.249-10	Default (Fixed-Price Construction)	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.201-7000	Contracting Officer's Representative	DEC 1991
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	DEC 2004
252.203-7002	Display Of DOD Hotline Poster	DEC 1991
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7004 Alt A	Central Contractor Registration (52.204-7) Alternate A	NOV 2003
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	MAR 1998
252.219-7003	Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (DOD Contracts)	APR 1996
252.223-7004	Drug Free Work Force	SEP 1988
252.225-7012	Preference For Certain Domestic Commodities	JUN 2004
252.227-7033	Rights in Shop Drawings	APR 1966
252.231-7000	Supplemental Cost Principles	DEC 1991
252.236-7000	Modification Proposals-Price Breakdown	DEC 1991
252.236-7008	Contract Prices-Bidding Schedules	DEC 1991
252.242-7000	Postaward Conference	DEC 1991
252.243-7001	Pricing Of Contract Modifications	DEC 1991
252.243-7002	Requests for Equitable Adjustment	MAR 1998
252.247-7023	Transportation of Supplies by Sea	MAY 2002
252.247-7024	Notification Of Transportation Of Supplies By Sea	MAR 2000

CLAUSES INCORPORATED BY FULL TEXT

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
3.6%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4

shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer's identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Dover, New Hampshire – Stafford County

(End of provision)

52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (JAN 2005)

(a) Definitions. As used in this clause--

Component means an article, material, or supply incorporated directly into a construction material.

Construction material means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

Cost of components means--

- (1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the construction material.

Domestic construction material means--

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

Foreign construction material means a construction material other than a domestic construction material.

United States means the 50 States, the District of Columbia, and outlying areas.

(b) Domestic preference. (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows:

NONE

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American Act. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including--

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

- (F) Location of the construction project;
- (G) Name and address of the proposed supplier; and
- (H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.
- (ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.
- (iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).
- (iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.
- (2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.
- (3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.
- (d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison

Construction material description	Unit of measure	Quantity	Price (dollars)\1\
Item 1			
Foreign construction material....			
Domestic construction material...			
Item 2			
Foreign construction material....			
Domestic construction material...			

Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).

List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.

Include other applicable supporting information.

(End of clause)

All contractor employees (U.S. Citizens and Non-U.S. Citizens) working under this contract who require access to Automated Information Systems (AIS), (stand alone computers, network computers/systems, email) shall, at a minimum, be designated into an ADP-III position (non sensitive) in accordance with DoD 5220-22-R, Industrial Security Regulation. The investigative requirements for an ADP – III position are favorable National Agency Check (NAC), SF-85P, Public Trust Position. The contractor shall have each applicable employee complete a SF-85P and submit to the U.S. Army Engineer District, New England, 696 Virginia Road, Concord, MA 01742-2751, Security Officer, within three (3) working days after award of any contract or task order, and shall be submitted prior to the individual being permitted to access AIS. Contractors that have a commercial or government entity (CAGE) Code and Facility Security Clearance through the Defense Security Service shall process the NAC's and forward visit requests/results of NAC to the U.S. Army Engineer District, New England, 696 Virginia Road, Concord, MA 01742-2751 – Security Officer. For those contractors that do not have a Cage Code or Facility Security Clearance, the U.S. Army Engineer District, New England – Bldg 1, 696 Virginia Road, Concord, MA 01742-2751, Security Officer will process the investigation in coordination with the Contractor and contract employees.

In accordance with Engineering Regulation, ER-380-1-18, Section 4, foreign nationals who work on Corps of Engineers' contracts or task orders shall be approved by HQUSACE Foreign Disclosure Officer or higher before beginning work on the contract/task order. This regulation includes subcontractor employees. (NOTE: exceptions to the above requirement include foreign nationals who perform janitorial and/or grounds maintenance services.) The contractor shall submit to the U.S. Army Engineer District, New England, Contracting Division, the names of all foreign nationals proposed for performance under this contract/task order, along with documentation to verify that he/she was legally admitted into the United States and has authority to work and/or go to school in the US. Such documentation may include a U.S. Passport, Certificate of U.S. Citizenship (INS Form N-560 or N-561), Certificate of Naturalization (INS Form N-550 or N-570), foreign passport with I-551 stamp or attached INS Form I-94 indicating employment authorization, Alien Registration Receipt Card with photograph (INS Form I-151 or I-551), Temporary Resident Card (INS Form I-688), Employment Authorization Card (INS Form I-688A), Reentry Permit (INS Form I-327), Refugee Travel Document (INS Form I-571), Employment Authorization Document issued by INS which contains a photograph (INS Form I-688B).

52.231-5000 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE MAR 1995)--EFARS

(a) This clause does not apply to terminations. See 52.249-5000, Basis for Settlement of Proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region _____. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the contracting officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-

leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

(End of clause)

52.232-5002 CONTINUING CONTRACTS (ALTERNATE) (MAR 1995)--EFARS

(a) Funds are not available at the inception of this contract to cover the entire contract price. The sum of \$10,000.00 has been reserved for this contract and is available for payment to the contractor during the current fiscal year. It is expected that Congress will make appropriations for future fiscal years from which additional funds, together with funds provided by one or more non-federal project sponsors will be reserved for this contract. The liability of the United States for payments beyond the funds reserved for this contract is contingent on the reservation of additional funds.

(b) Failure to make payments in excess of the amount currently reserved, or that may be reserved from time to time, shall not be considered a breach of this contract, and shall not entitle the contractor to a price adjustment under the terms of this contract except as specifically provided in paragraphs (e) and (h) below.

(c) The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The contracting officer will promptly notify the contractor of any additional funds reserved for the contract by issuing an administrative modification to the contract.

(d) If earnings will be such that funds reserved for the contract will be exhausted before the end of any fiscal year, the contractor shall give written notice to the contracting officer of the estimated date of exhaustion and the amount of additional funds which will be needed to meet payments due or to become due under this contract during that fiscal year. This notice shall be given not less than 45 nor more than 60 days prior to the estimated date of exhaustion.

(e) No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract. If and when sufficient additional funds are reserved, the contractor shall be entitled to simple interest on any payment that the contracting officer determines was actually earned under the terms of this contract and would have been made except for exhaustion of funds. Interest shall be computed from the time such payment would otherwise have been made until actually or constructively made, and shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT 97, as in effect on the first day of the delay in such payment.

(f) Any suspension, delay, or interruption of work arising from exhaustion or anticipated exhaustion of funds shall not constitute a breach of this contract and shall not entitle the contractor to any price adjustment under a "Suspension of Work" or similar clause or in any other manner under this contract.

(g) An equitable adjustment in performance time shall be made for any increase in the time required for performance of any part of the work arising from exhaustion of funds or the reasonable anticipation of exhaustion of funds.

(h) If, upon the expiration of sixty (60) days after the beginning of the fiscal year following an exhaustion of funds, the Government has failed to reserve sufficient additional funds to cover payments otherwise due, the contractor, by written notice delivered to the contracting officer at any time before such additional funds are reserved, may elect to treat his right to proceed with the work as having been terminated. Such a termination shall be at no cost to the Government, except that, to the extent that additional funds to make payment therefore are allocated to this contract, it may be treated as a termination for the convenience of the Government.

(i) If at any time it becomes apparent that the funds reserved for any fiscal year are in excess of the funds required to meet all payments due or to become due the contractor because of work performed and to be performed under this contract during the fiscal year, the Government reserves the right, after notice to the contractor, to reduce said reservation by the amount of such excess.

(j) The term "Reservation" means monies that have been set aside and made available for payments under this contract.

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

<http://farsite.hill.af.mil>

<http://www.hq.usace.army.mil/cepr/asp/library/efar.asp>

<http://acqnet.saalt.army.mil/LIBRARY>

(End of clause)

Section 00800 - Special Contract Requirements

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS

02/95

1.1 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK (APR 1984) FAR 52.211-10

(a) The Contractor shall be required to--

(1) commence work under this contract within 15 calendar days after the date the Contractor receives the Notice to Proceed (NTP), and commence dredging work at the site within 30 days after the date the Contractor receives the NTP (providing this date is within the dredging season),

(2) prosecute the work diligently and maintain a dredging production rate, based on working 24 hours per day, of not less than 12,000 cubic yards for each 30 calendar day period of actual dredging work at the site, and

(3) complete the dredge and rock removal work ready for use not later than 15 March 2006. See "1.1 b" below for additional information. The time stated for completion shall include final cleanup. See Paragraph "Work Sequence" in Section 01110 SUMMARY OF WORK.

(b) Due to environmental restrictions, dredging operations at the project site will only be permitted from 15 November 2005 through 15 March 2006, inclusive. If the NTP is received prior to 15 November 2005, in preparation for dredging operations at the site, the Contractor shall promptly place all orders, award subcontracts, process required submittals and details to ensure effective action when dredging operations at the site are required to commence. Dredging operations are required to commence within 30 days of NTP, provided that this date is within the dredging season. If 30 days after NTP is prior to 15 November 2005, dredging operations are required to commence on 15 November 2005.

(d) The excavation of material shall be from within the areas indicated on the contract drawings. Excavation of material shall be conducted using a mechanical dredge with a closed bucket, scows, and attendant plant to maintain the required minimum production rate of 12,000 cubic yards of material for each 30 calendar day period.

1.2 LIQUIDATED DAMAGES - CONSTRUCTION (SEPT 2000) FAR 52.211-12

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of \$1,175.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Contractor exceeds 42,000 CY (which is 35,000 CY, or the quantity to be dredged, plus an overage allowance of 20%, or 7,000 CY) of dredged material disposed of at the designated disposal area, and has dredged beyond the allowable overdepth prism, liquidated damages of \$72 per CY for all the material disposed of in excess of the 42,000 CY limit shall apply.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

1.3 TIME EXTENSIONS (SEPT 2000) FAR 52.211-13

Time extensions for contract changes will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements related to the changed work and that the remaining contract completion dates for all other portions of the work will not be altered. The change order also may provide an equitable readjustment of liquidated damages under the new completion schedule.

1.4 CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000) DFARS 252.236-7001

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference. The drawings will be provided to the Contractor in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall-

- (1) Check all drawings furnished immediately upon receipt;
- (2) Compare all drawings and verify the figures before laying out the work;
- (3) Promptly notify the Contracting Officer of any discrepancies;
- (4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and
- (5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

- (1) Large-scale drawings shall govern small-scale drawings; and
- (2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and to the contract drawings identified on the "Index to Drawings" found on Sheet C-1 (2 of 14) of the contract drawings.

1.5 DESIGNATED BILLING OFFICE

Reference Contract Clause titled "PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS" located in SECTION 00700 CONTRACT CLAUSES. The "designated billing office" will be the Construction Area Engineer, Resident Engineer or project office where the Contracting Officer Representative for this contract is located. The Contractor will be notified of the exact location of this office at the project preconstruction conference specified in Section 01110 SUMMARY OF WORK.

1.6 BID GUARANTEE (SEP 1996) FAR 52.228-1

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) The amount of the bid guarantee shall be twenty percent of the bid price or \$3,000,000, whichever is less.

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

1.7 OBSTRUCTION OF NAVIGABLE WATERWAYS DFAR 252.236-7002(DEC 1991)

(a) The Contractor shall-

(1) Promptly recover and remove any material, plant, machinery, or appliance which the contractor loses, dumps, throws overboard, sinks, or misplaces, and which, in the opinion of the Contracting Officer, may be dangerous to or obstruct navigation;

(2) Give immediate notice, with description and locations of any such obstructions, to the Contracting Officer; and

(3) When required by the Contracting Officer, mark or buoy such obstructions until the same are removed.

(b) The Contracting Officer may-

(1) Remove the obstructions by contract or otherwise should the Contractor refuse, neglect, or delay compliance with paragraph (a) of this clause; and

(2) Deduct the cost of removal from any monies due or to become due to the Contractor; or

(3) Recover the cost of removal under the Contractor's bond.

(c) The Contractor's liability for the removal of a vessel wrecked or sunk without fault or negligence is limited to that provided in Sections 15, 19, and 20 of the River and Harbor Act of March 3, 1899 (33 U.S.C. 410 et.seq.).

1.8 PAYMENT FOR MOBILIZATION AND DEMOBILIZATION

(DEC 1991) DFARS 252.236-7004.

a. The Government will pay all costs for the mobilization and demobilization of all of the Contractor's plant and equipment at the contract lump sum price for this item.

(1) Sixty percent of the lump sum price upon completion of the Contractor's mobilization at the work site.

(2) The remaining 40 percent upon completion of demobilization.

b. The Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid if the Contracting Officer believes that the percentages in paragraphs a(1) and a(2) of this clause do not bear a reasonable relation to the cost of the work in this contract.

(1) Failure to justify such price to the satisfaction of the Contracting Officer will result in payment, as determined by the Contracting Officer, of --

(i) Actual mobilization costs at completion of mobilization;

(ii) Actual demobilization costs at completion of demobilization;
and

(iii) The remainder of this item in the final payment under this contract.

(2) The Contracting Officer's determination of the actual costs in paragraph b(1) of this clause is not subject to appeal.

1.9 VARIATIONS IN ESTIMATED QUANTITIES SUBDIVIDED ITEMS (MAR 1995)EFARS
52.212-5001

This variation in estimated quantities clause is applicable only to Item Numbers 0003 and 0004.

(a) Variation from the estimated quantity in the actual work performed under any second or subsequent sub-item or elimination of all work under such a second or subsequent sub-item will not be the basis for an adjustment in contract unit price.

(b) Where the actual quantity of work performed for Item Numbers 0003 and 0004 is less than 85% of the quantity of the first sub-item listed under such item, the contractor will be paid at the contract unit price for that sub-item for the actual quantity of work performed and, in addition, an equitable adjustment shall be made in accordance with the clause FAR 52.212-11, Variation in Estimated Quantities.

(c) If the actual quantity of work performed under Item Numbers 0003 and 0004 exceeds 115% or is less than 85% of the total estimated quantity of the sub-item under that item and/or if the quantity of the work performed under the second sub-item or any subsequent sub-item under Item Numbers 0003 and 0004 exceeds 115% or is less than 85% of the estimated quantity of any such sub-item, and if such variation causes an increase or a decrease in the time required for performance of this contract the contract completion time will be adjusted in accordance with the clause FAR 52.211-18, Variation in Estimated Quantities.

1.10 QUANTITY SURVEYS. (APR 1984) ALTERNATE 1 FAR 52.236-16

a) Quantity surveys shall be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed and the actual construction completed and in place.

(b) The Government will conduct the original and final surveys and make the computations based on them. The Contractor shall conduct the surveys for any periods for which progress payments are requested and shall make the computations based on these surveys. All surveys conducted by the Contractor shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance.

(c) Promptly upon completing a survey, the Contractor shall furnish the originals of all field notes and all other records relating to the survey or to the layout of the work to the Contracting Officer, who shall use them as necessary to determine the amount of progress

payments. The Contractor shall retain copies of all such material furnished to the Contracting Officer.

WAGE DETERMINATION

General Decision Number: NH030011 05/06/2005 NH11

State: New Hampshire

Construction Types: Heavy Dredging

Counties: Hillsborough and Rockingham Counties in New Hampshire.

NEW HAMPSHIRE

All Dredging, except self propelled hopper dredges, on the Atlantic Coast

Modification Number	Publication Date
0	06/13/2003
1	05/21/2004
2	12/03/2004
3	05/06/2005

* ENGI0025-001 10/01/2004

STATEWIDE

	Rates	Fringes
Company Lead Dredgeman		
Lead Dredgeman.....	\$ 28.97	7.80+a+b
Dipper & Clamshell Dredge		
Boat Captain.....	\$ 23.05	7.20+a+b
Boat Master.....	\$ 24.14	7.80+a+b
Deckhand, Tug Deckhand.....	\$ 18.83	6.60+a+b
Engineer.....	\$ 25.37	7.80+a+b
Maintenance Engineer.....	\$ 24.49	7.20+a+b
Mate.....	\$ 22.89	7.20+a+b
Oiler.....	\$ 19.29	6.60+a+b
Operator.....	\$ 28.97	7.80+a+b
Scowman.....	\$ 18.78	6.60+a+b
Welder.....	\$ 24.12	7.20+a+b
Diver		
Diver.....	\$ 41.53	6.87+a+b
Standby Diver.....	\$ 27.85	6.87+a+b
Standby Tender.....	\$ 23.26	6.27+a+b
Tender.....	\$ 32.11	6.87+a+b
Drag Bucket Dredge		
Deckhand.....	\$ 16.17	5.25+a+b
Engineer.....	\$ 21.41	6.45+a+b
Maintenance Engineer.....	\$ 21.21	5.85+a+b
Mate.....	\$ 19.82	5.85+a+b
Operator.....	\$ 25.09	6.45+a+b
Dredging Pipeline Cable-Laying		
Control Tower Operator.....	\$ 25.55	6.87+a+b
Diver Tender.....	\$ 26.58	6.87+a+b
Diver.....	\$ 42.42	6.87+a+b
Leverman.....	\$ 28.83	6.87+a+b
Line up Operator, End Prep..	\$ 18.47	5.67+a+b
Rigger.....	\$ 19.07	5.67+a+b
Drill Boats		
Blaster.....	\$ 23.81	6.45+a+b
Core Driller.....	\$ 19.00	5.25+a+b

Driller.....	\$ 23.55	6.45+a+b
Engineer.....	\$ 23.54	6.45+a+b
Machinist.....	\$ 23.30	5.85+a+b
Oiler.....	\$ 20.46	5.25+a+b
Tug Captain.....	\$ 19.53	5.85+a+b
Tug Deckhand.....	\$ 15.97	5.25+a+b
Tug Master.....	\$ 20.48	6.45+a+b
Welder.....	\$ 23.30	5.85+a+b
Engineer		
1st.....	\$ 25.55	6.87+a+b
2nd, 3rd and 4th.....	\$ 25.23	6.87+a+b
Electrician.....	\$ 25.68	6.87+a+b
Electro Hydro Technician....	\$ 20.79	6.27+a+b
Tug Captain.....	\$ 23.44	6.87+a+b
Tug Master.....	\$ 26.80	6.87+a+b
Hydraulic Dredge		
Asst. Fill Placer.....	\$ 22.70	7.80+a+b
Boat Captain.....	\$ 23.05	7.20+a+b
Boat Master.....	\$ 24.13	7.80+a+b
Chief Mate.....	\$ 24.72	7.80+a+b
Chief Welder.....	\$ 25.38	7.80+a+b
Deckhand.....	\$ 19.23	6.60+a+b
Engineer.....	\$ 24.82	7.80+a+b
Fill Placer.....	\$ 24.72	7.80+a+b
Janitor/Porter.....	\$ 18.39	6.60+a+b
Leverman.....	\$ 28.97	7.80+a+b
Maintenance Engineer.....	\$ 24.49	7.20+a+b
Mate.....	\$ 22.89	7.20+a+b
Messman.....	\$ 18.39	6.60+a+b
Night Cook.....	\$ 18.90	6.60+a+b
Oiler.....	\$ 19.29	6.60+a+b
Shoreman.....	\$ 18.80	6.60+a+b
Spider Barge Operator.....	\$ 23.91	7.20+a+b
Steward.....	\$ 22.84	7.80+a+b
Welder-Dredge.....	\$ 24.11	7.20+a+b
Tug Boats over 1000 H.P.		
with master or captain		
having license endorsed		
for 200 miles off shore		
Tug Captain.....	\$ 24.59	7.80+a+b
Tug Chief Engineer.....	\$ 23.85	7.20+a+b
Tug Deckhand.....	\$ 19.23	6.60+a+b
Tug Engineer.....	\$ 23.38	7.20+a+b

PREMIUMS: Additional 20% for hazardous material work

FOOTNOTES APPLICABLE TO ABOVE CRAFTS:

a. PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr.'s Birthday, Memorial Day, Good Friday, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day

b. VACATION: Seven percent (7%) of the straight time rate multiplied by the total hours worked.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as

provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

The request should be accompanied by a full statement of the Interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

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00320 GEOTECHNICAL DATA

DIVISION 01 - GENERAL REQUIREMENTS

01110 SUMMARY OF WORK
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01330 SUBMITTAL PROCEDURES
01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE (HTRW/UST)
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02325 DREDGING
02328 UNDERWATER DRILLING AND BLASTING

-- End of Project Table of Contents --

PLANT AND EQUIPMENT LIST

The bidder must complete the following plant and equipment list by listing the plant available to the Bidder and proposed to be used on the work of this contract. Add additional pages as necessary. Attach the completed list to the BIDDING SCHEDULE and submit the list with the bid. Failure to complete this list and submit it with the BIDDING SCHEDULE may be cause for the rejection of the bid. Prior to commencement of work at the site, the Contractor will be required to submit for review copies of all applicable current inspections, certificates and surveys for all floating plant

BUCKET DREDGES (Clamshell/Dipper/Excavator/Dragline)

Dredge Name and Type	Manufacturer and Age	Bucket Size and Swings/Hour	Capacity – Cubic Yards/Month*	Type and HP of Engine

HYDRAULIC/SUCTION/HOPPER DREDGE

Dredge Name and Type	Manufacturer and Age	Inside Diameter of Discharge Pipe	Capacity – Cubic Yards/Month*	Type and HP of Pump Engine

BARGES/SCOWS

Name And Type	Manufacturer And Age	Length & Beam	Draft - Light	Draft – Loaded	Capacity (Cubic Yards)	Number and Size Of Drills

ATTENDANT PLANT (Give columnar information pertinent to items listed, if to be used)

	Name	Manufacturer And Age	Type and HP Of Engine	Length & Beam	Remarks
Tug					
Tug					
Launch					

(*) When working materials similar to those anticipated to be encountered in the performance of work

DOCUMENT TABLE OF CONTENTS

DOCUMENTS 00 - INTRODUCTORY, BIDDING, AND CONTRACT REQUIREMENTS

DOCUMENT 00320

GEOTECHNICAL DATA

PART 1 GENERAL

- 1.1 SUMMARY
- 1.2 REFERENCES
- 1.3 SOIL CLASSIFICATION
- 1.4 INTERPRETATION
- 1.5 LABORATORY TESTS

-- End of Document Table of Contents --

DOCUMENT 00320

GEOTECHNICAL DATA

PART 1 GENERAL

1.1 SUMMARY

The subsurface conditions in the federal navigation channel indicated in the specifications are the result of laboratory testing of composite samples from different reaches of the channel. No borings have been conducted within the federal channel. This data is provided for informational purposes only and no interpretation of the data is provided in this specification.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referenced to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 2487	(2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2488	(2000) Description and Identification of Soils (Visual-Manual Procedure)
ASTM D 4318	(2000) Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.3 SOIL CLASSIFICATION

The soil classification of the soil samples were performed in accordance with ASTM D 2488 in the boring logs, and ASTM D 2487 in the laboratory.

1.4 INTERPRETATION

Subsurface investigation data are provided only for information purposes and for the convenience of the Contractor. The data shown on the boring logs is for the specific locations indicated only and no assurance is given that these conditions are representative of conditions between borings or areas adjacent thereto. The responsibility lies with the Contractor to interpret subsurface conditions that may affect his work.

1.5 LABORATORY TESTS

Laboratory tests for the samples composites for reaches of the federal channel were generally performed in accordance with the following test methods:

Particle Size Analysis: ASTM D 422

Liquid and Plastic Limits: ASTM D 4318

Note: Not all samples were tested in the laboratory using all the methods described above.

-- End of Section --

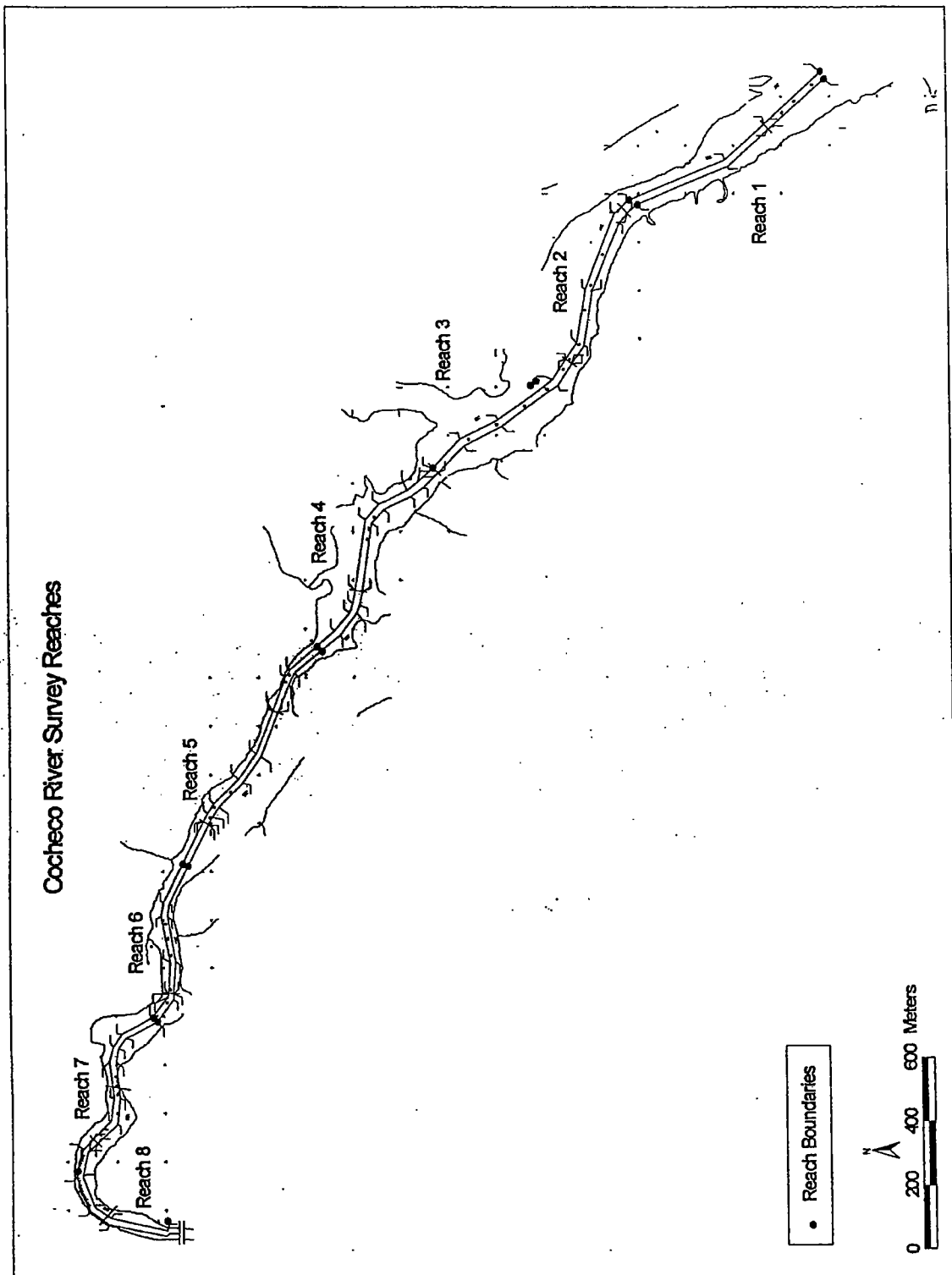
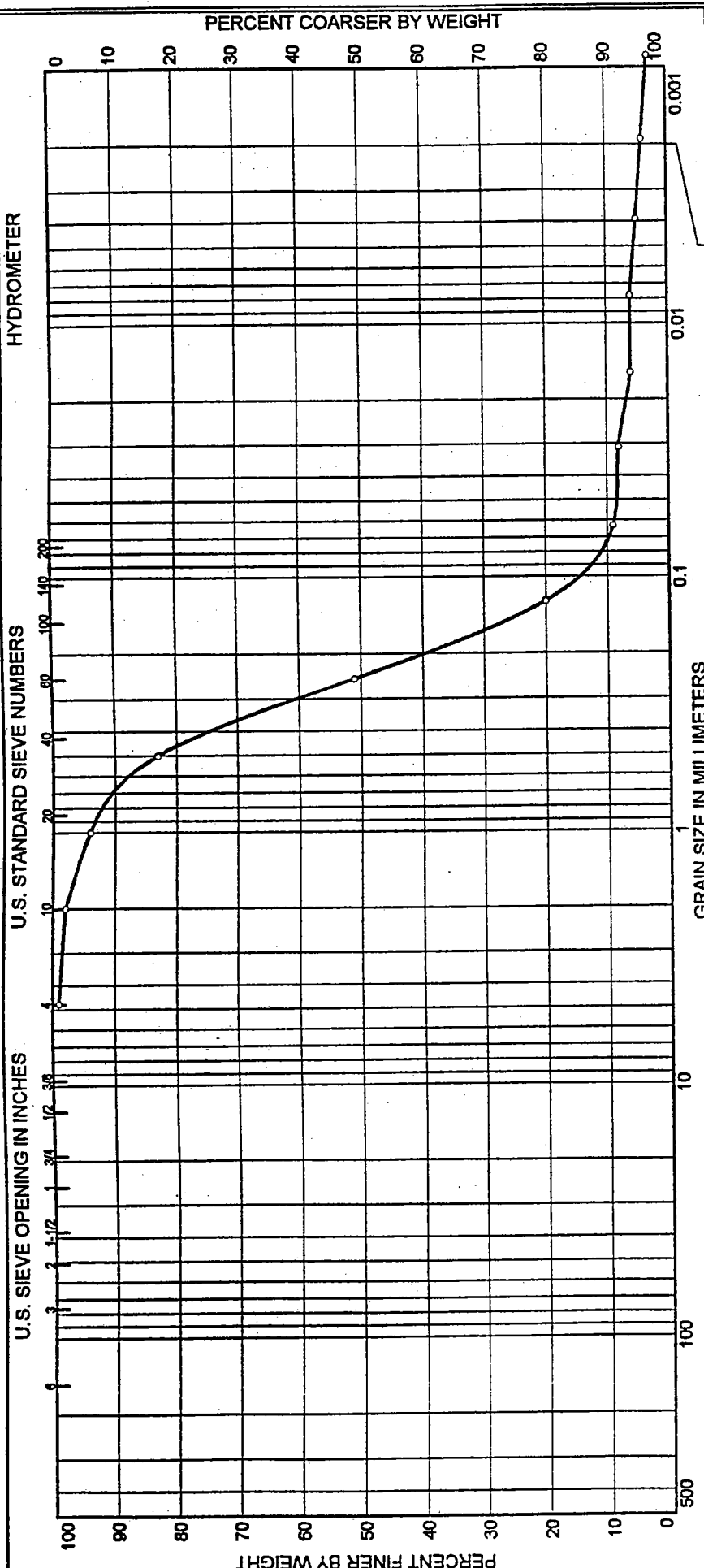


Figure 1. Cocheco River/Sampling Reaches

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES		% GRAVEL		% SAND		% SILT		% CLAY	
0.0		0.0		88.8		6.2		4.1	

Client Battelle		SOIL TECHNOLOGY, INC.	
Project Cochecho River Sediments			
Project No. J-1106	Plate	1	

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

urce:
ple No.: Reach 1
v. or Depth: Sample Length (in./cm.):
ation:
cription: Poorly graded sand with silt
e: Natural Moisture: 36
iquid Limit: Plastic Limit: USCS Class.: SP-SM
isting Remarks: Granular Non-Plastic

Mechanical Analysis Data

ive	Size, mm	Percent finer
	4.750	99.0
0	2.000	98.0
8	1.000	94.0
5	0.500	83.0
0	0.250	51.0
20	0.125	20.0
30	0.063	9.0

Hydrometer Analysis Data

Size, mm	Percent finer
0.0310	8.0
0.0156	6.0
0.0078	6.0
0.0039	5.0
0.0019	4.0
0.0009	3.0

Fractional Components

vel/Sand based on #4
d/Fines based on #200
OBBLIES = 0.0 % GRAVEL = 0.0 % SAND = 88.8
ILT = 6.2 % CLAY = 4.1 (% CLAY COLLOIDS = 3.1)

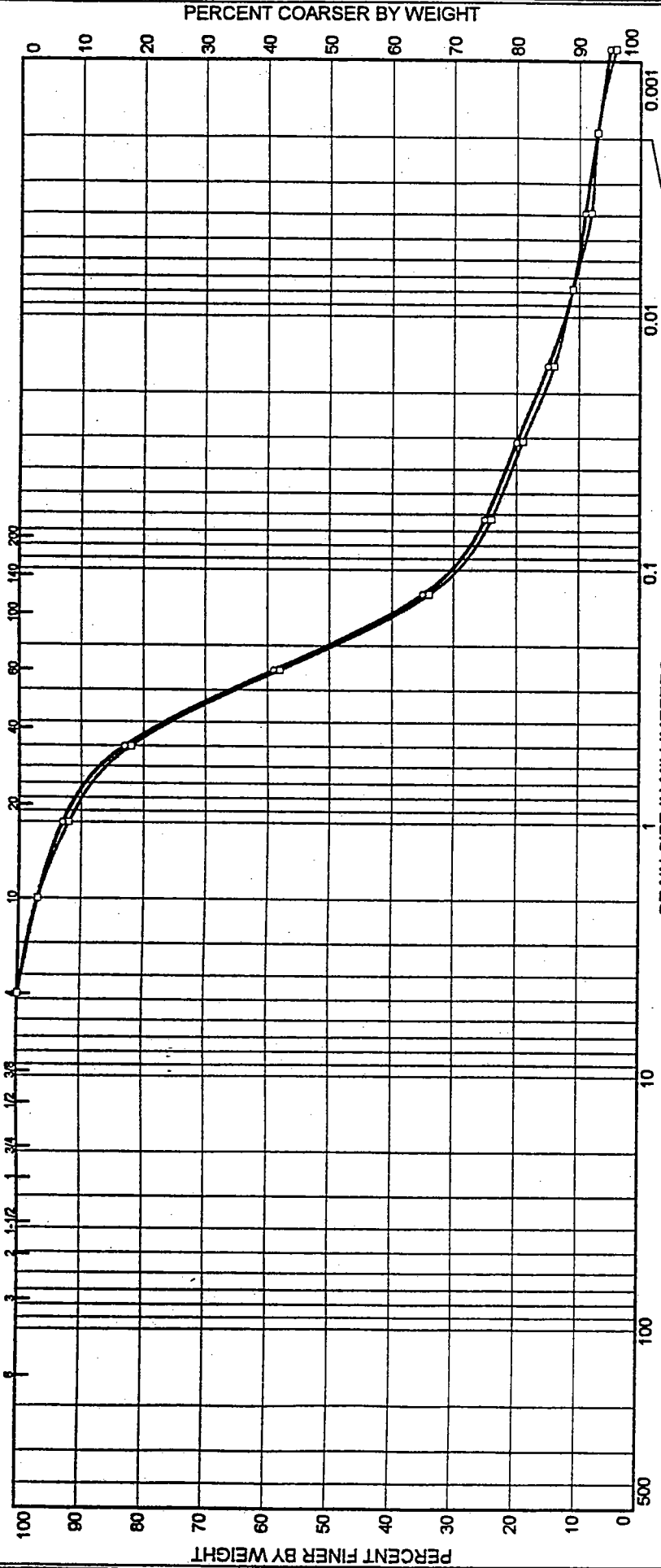
= 0.54 D₆₀= 0.30 D₅₀= 0.25
= 0.16 D₁₅= 0.10 D₁₀= 0.07
1.2229 C_u= 4.0579

PARTICLE SIZE DISTRIBUTION TEST REPORT

U.S. SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



GRAIN SIZE IN MILLIMETERS	% SAND	% SILT	% CLAY
73.4	73.4	19.5	7.1
74.4	74.4	18.5	7.1

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	Reach 2			SM	Silty sand	42	26	23
	Duplicate 1							
	Reach 2			SM	Silty sand	42	26	23

Client Battelle		<input type="checkbox"/> SOIL TECHNOLOGY, INC.
Project Cochocho River Sediments		
Cochocho River Sediments		
Project No. J-1106	Plate 2	

GRAIN SIZE DISTRIBUTION TEST DATA

nt: Battelle
ect: Cocheco River Sediments
ect Number: J-1106

Sample Data

ce:
le No.: Reach 2 Duplicate 1
r. or Depth: Sample Length (in./cm.):
tion:
ription: Silty sand
s: Natural Moisture: 42
id Limit: 26 Plastic Limit: 23 USCS Class.: SM
ing Remarks:

Mechanical Analysis Data

e	Size, mm	Percent finer
	4.750	100.0
	2.000	97.0
	1.000	93.0
	0.500	83.0
	0.250	59.0
0	0.125	35.0
0	0.063	25.0

Hydrometer Analysis Data

Size, mm	Percent finer
0.0312	20.0
0.0156	15.0
0.0078	11.0
0.0039	9.0
0.0019	7.0
0.0009	5.0

Fractional Components

el/Sand based on #4
/Fines based on #200
BBLES = 0.0 % GRAVEL = 0.0 % SAND = 73.4
LT = 19.5 % CLAY = 7.1 (% CLAY COLLOIDS = 5.3)

0.54 D60= 0.26 D50= 0.20
0.10 D15= 0.02 D10= 0.01
6.4101 Cu= 44.1807

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

orce:
ple No.: Reach 2 Duplicate 2
v. or Depth: Sample Length (in./cm.):
ation:
cription: Silty sand
e: Natural Moisture: 42
uid Limit: 26 Plastic Limit: 23 USCS Class.: SM
ting Remarks:

Mechanical Analysis Data

Size, mm	Percent finer
4.750	100.0
2.000	97.0
1.000	92.0
0.500	82.0
0.250	58.0
0.125	34.0
0.063	24.0

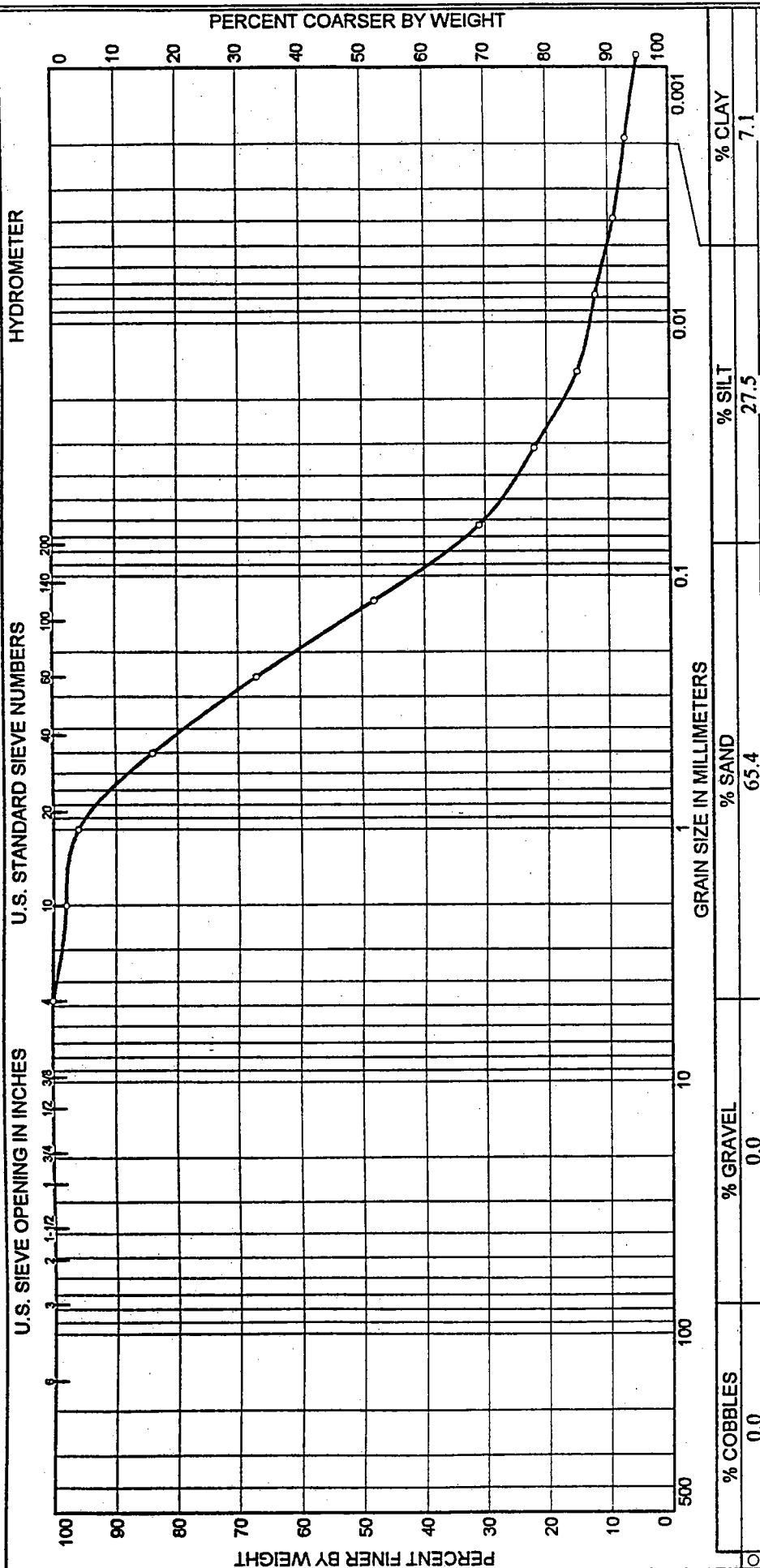
Hydrometer Analysis Data

Size, mm	Percent finer
0.0310	19.0
0.0156	14.0
0.0078	11.0
0.0039	8.0
0.0019	7.0
0.0009	4.0

Fractional Components

rel/Sand based on #4
l/Fines based on #200
BBLES = 0.0 % GRAVEL = 0.0 % SAND = 74.4
ILT = 18.5 % CLAY = 7.1 (% CLAY COLLOIDS = 4.5)
= 0.57 D₆₀= 0.26 D₅₀= 0.20
= 0.10 D₁₅= 0.02 D₁₀= 0.01
6.4774 C_u= 41.7242

HYDROMETER

[illegible]

Client Battelle		SOIL TECHNOLOGY, INC.
Project Cochecho River Sediments		
Project No. J-1106	Plate 3	

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

rice:
ple No.: Reach 3
v. or Depth: Sample Length (in./cm.):
ation:
cription: Silty sand
e: Natural Moisture: 43
uid Limit: 29 Plastic Limit: 28 USCS Class.: SM
ting Remarks:

Mechanical Analysis Data

ve	Size, mm	Percent finer
	4.750	100.0
0	2.000	98.0
8	1.000	96.0
5	0.500	84.0
0	0.250	67.0
20	0.125	48.0
30	0.063	31.0

Hydrometer Analysis Data

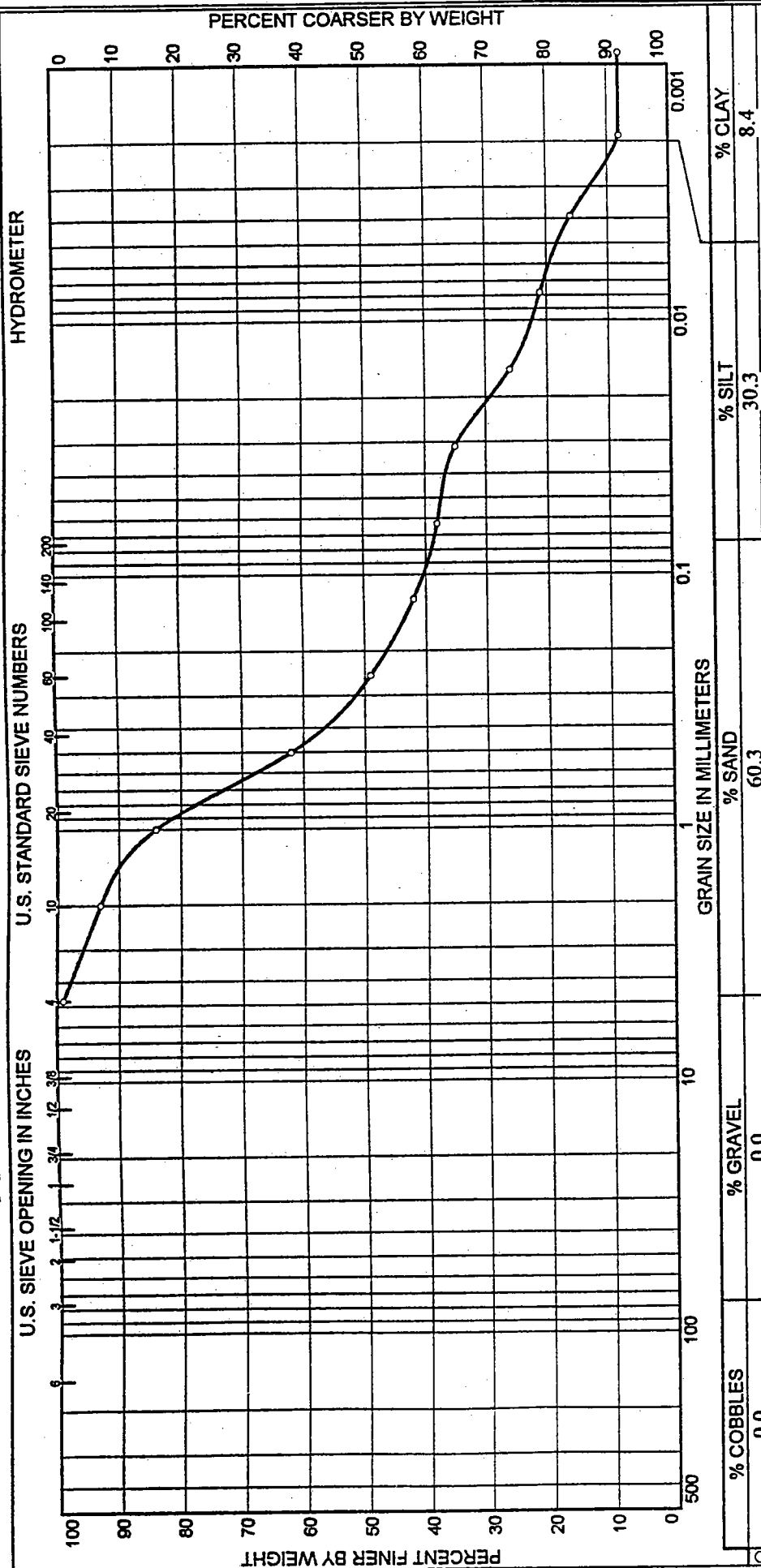
Size, mm	Percent finer
0.0312	22.0
0.0156	15.0
0.0078	12.0
0.0039	9.0
0.0019	7.0
0.0009	5.0

Fractional Components

vel/Sand based on #4
d/Fines based on #200
BBLES = 0.0 % GRAVEL = 0.0 % SAND = 65.4
ILT = 27.5 % CLAY = 7.1 (% CLAY COLLOIDS = 5.3)

= 0.52 D₆₀= 0.19 D₅₀= 0.13
= 0.06 D₁₅= 0.02 D₁₀= 0.00
3.7285 C_u= 39.0051

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES		% GRAVEL		% SAND		% SILT		% CLAY	
0.0		0.0		60.3		30.3		8.4	

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

ce:
le No.: Reach 4
v. or Depth: Sample Length (in./cm.):
ation:
cription: Silty sand
e: Natural Moisture: 38
uid Limit: 56 Plastic Limit: 31 USCS Class.: SM
ing Remarks:

Mechanical Analysis Data

Size, mm	Percent finer
4.750	99.0
2.000	93.0
1.000	84.0
0.500	62.0
0.250	49.0
0.125	42.0
0.063	38.0

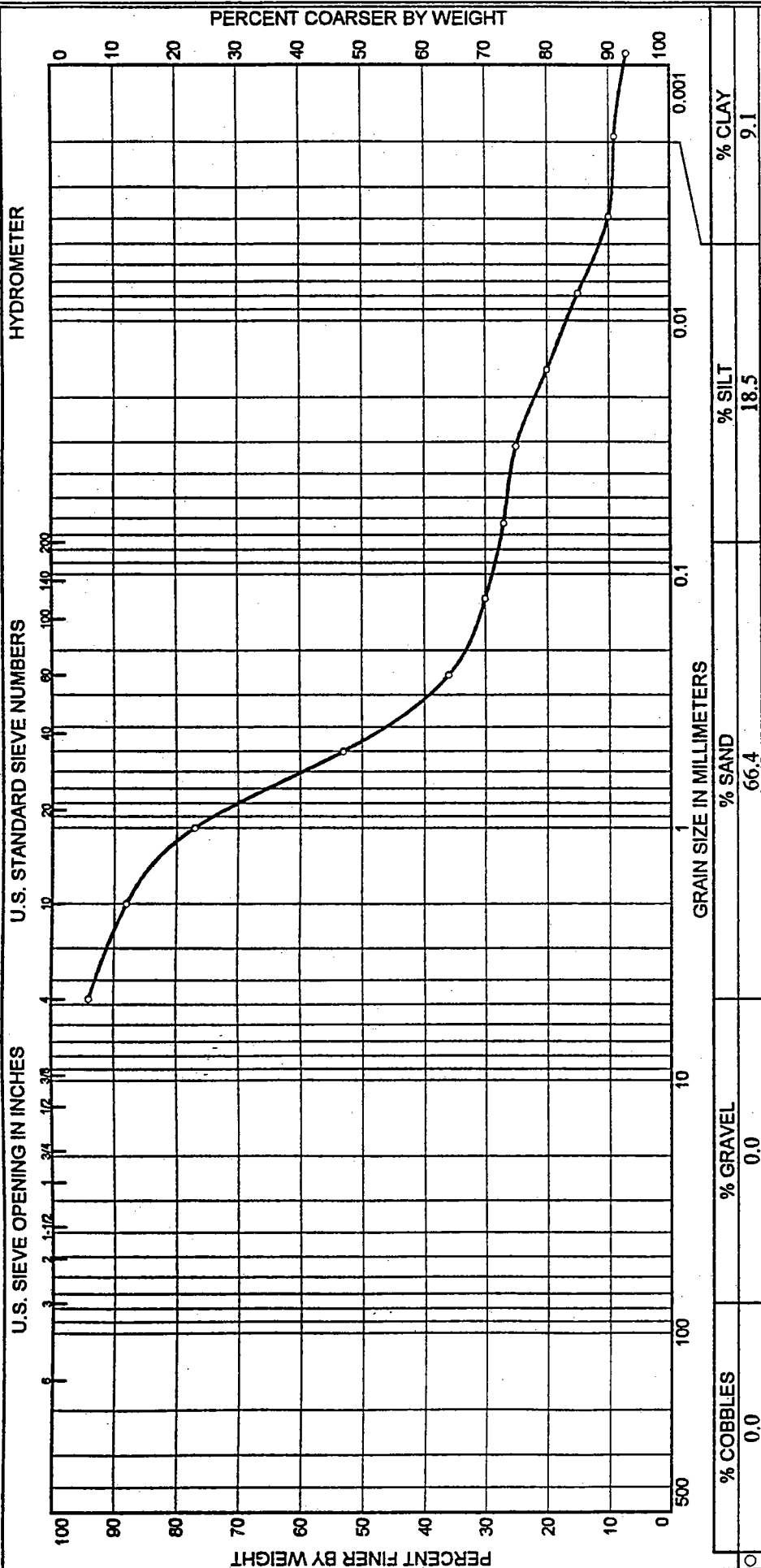
Hydrometer Analysis Data

Size, mm	Percent finer
0.0312	35.0
0.0156	26.0
0.0078	21.0
0.0039	16.0
0.0019	8.0
0.0009	8.0

Fractional Components

rel/Sand based on #4
l/Fines based on #200
BBLES = 0.0 % GRAVEL = 0.0 % SAND = 60.3
LT = 30.3 % CLAY = 8.4 (% CLAY COLLOIDS = 8.0)
= 1.04 D₆₀= 0.46 D₅₀= 0.27
= 0.02 D₁₅= 0.00 D₁₀= 0.00
0.401 C_u= 195.9059

PARTICLE SIZE DISTRIBUTION TEST REPORT

[illegible]

Client Battelle		SOIL TECHNOLOGY, INC.	0
Project Coheco River Sediments			
Project No. J-1106	Plate	5	

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

orce:
ple No.: Reach 5
v. or Depth: Sample Length (in./cm.):
ation:
cription: Clayey sand
e: Natural Moisture: 54
iquid Limit: 50 Plastic Limit: 28 USCS Class.: SC
oting Remarks:

Mechanical Analysis Data

ive	Size, mm	Percent finer
	4.750	94.0
0	2.000	88.0
8	1.000	77.0
5	0.500	53.0
0	0.250	36.0
20	0.125	30.0
30	0.063	27.0

Hydrometer Analysis Data

Size, mm	Percent finer
0.0312	25.0
0.0156	20.0
0.0078	15.0
0.0039	10.0
0.0019	9.0
0.0009	7.0

Fractional Components

vel/Sand based on #4
d/Fines based on #200
BOBBLES = 0.0 % GRAVEL = 0.0 % SAND = 66.4
ILT = 18.5 % CLAY = 9.1 (% CLAY COLLOIDS = 7.4)

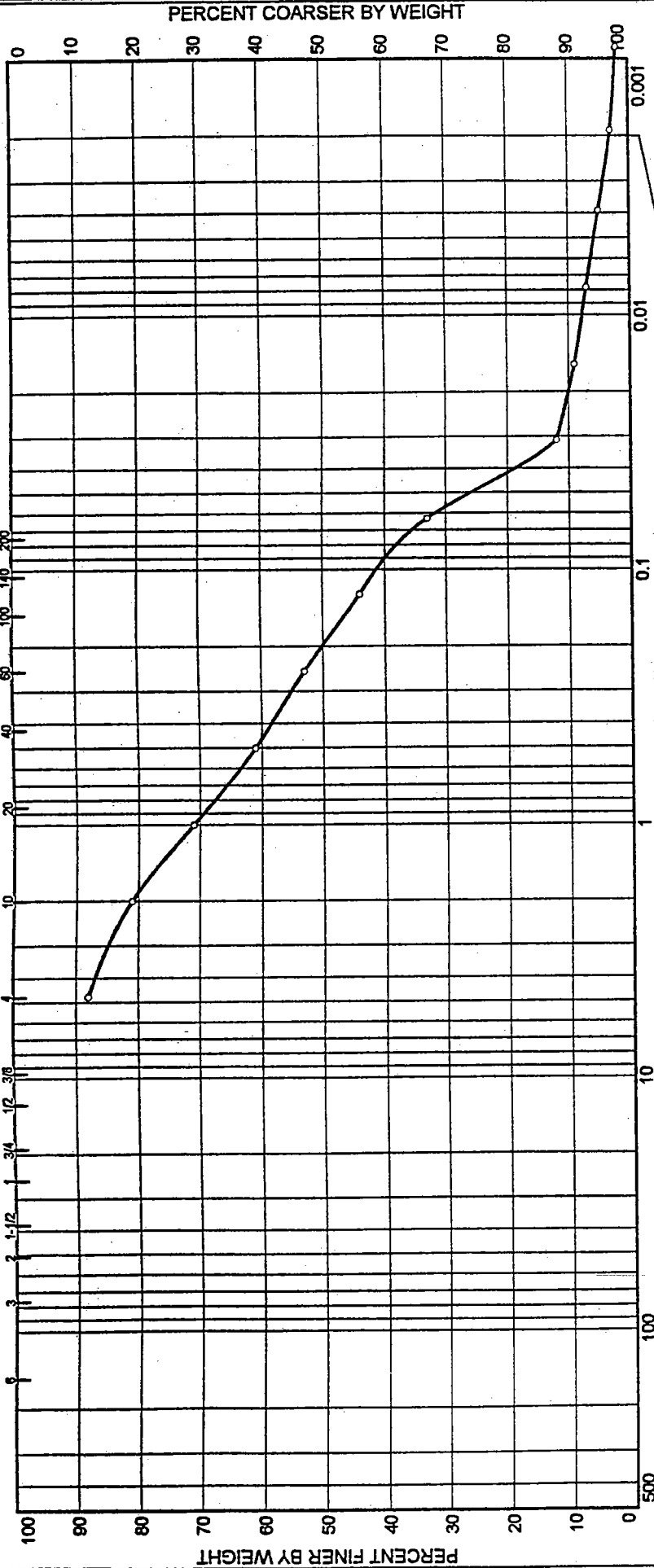
= 1.51 D₆₀= 0.61 D₅₀= 0.46
= 0.13 D₁₅= 0.01 D₁₀= 0.00
6.5863 C_u= 155.9728

PARTICLE SIZE DISTRIBUTION TEST REPORT

U.S. SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



% COBBLES		% GRAVEL		% SAND		% SILT		% CLAY	
0.0		0.0		51.1		33.8		3.1	

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	Reach 6			SM	Silty sand	36	33	27

Client_Battelle		SOIL TECHNOLOGY, INC.
Project Cocheco River Sediments		
Project No. J-1106	Plate 6	

GRAIN SIZE DISTRIBUTION TEST DATA

ant: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

rice:
ple No.: Reach 6
v. or Depth: Sample Length (in./cm.):
ation:
cription: Silty sand
e: Natural Moisture: 36
uid Limit: 33 Plastic Limit: 27 USCS Class.: SM
ting Remarks:

Mechanical Analysis Data

ve	Size, mm	Percent finer
	4.750	88.0
0	2.000	81.0
3	1.000	71.0
5	0.500	61.0
0	0.250	53.0
20	0.125	44.0
30	0.063	33.0

Hydrometer Analysis Data

Size, mm	Percent finer
0.0310	12.0
0.0156	9.0
0.0078	7.0
0.0039	5.0
0.0019	3.0
0.0009	2.0

Fractional Components

vel/Sand based on #4
d/Fines based on #200
BBLES = 0.0 % GRAVEL = 0.0 % SAND = 51.1
ILT = 33.8 % CLAY = 3.1 (% CLAY COLLOIDS = 2.1)

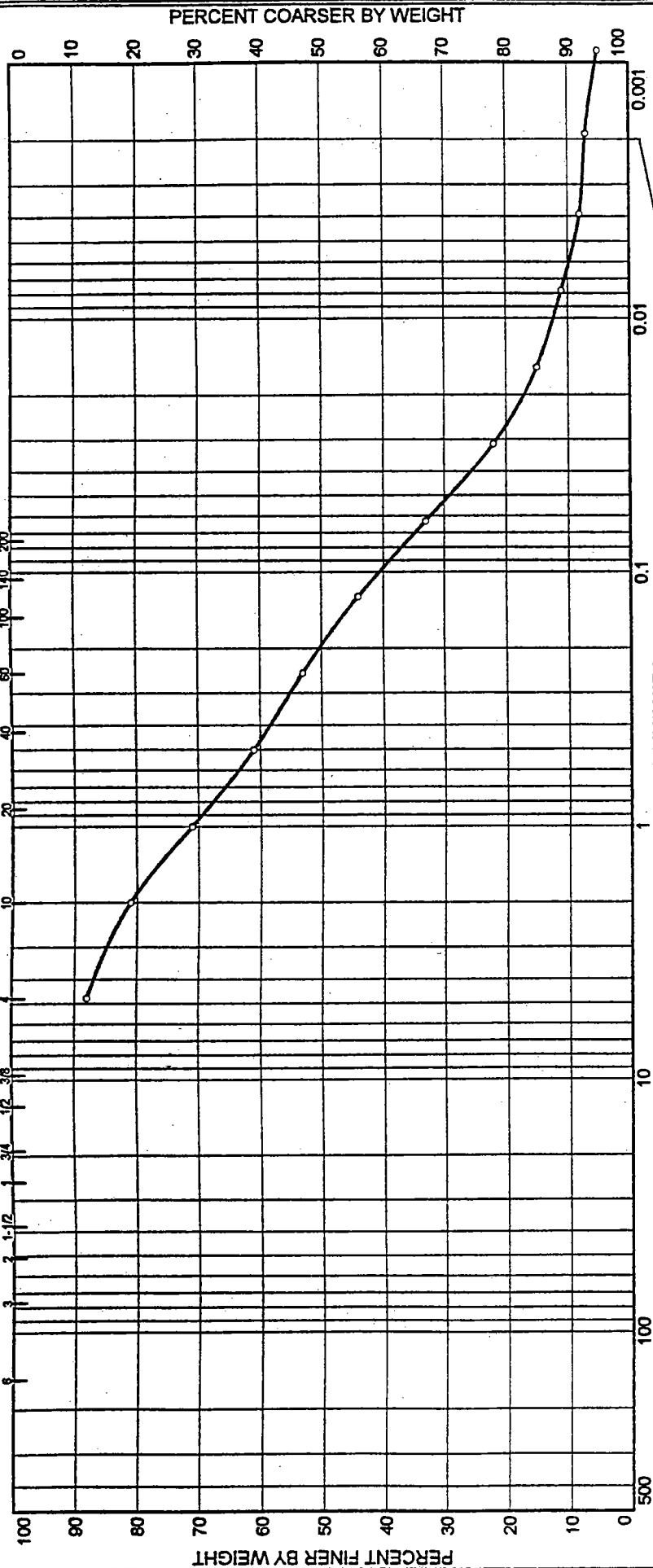
= 3.05 D₆₀= 0.46 D₅₀= 0.20
= 0.06 D₁₅= 0.04 D₁₀= 0.02
0.3467 C_u= 22.8634

PARTICLE SIZE DISTRIBUTION TEST REPORT

U.S. SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



% COBBLES		% GRAVEL		% SAND		% SILT		% CLAY	
0.0		0.0		52.1		28.8		7.1	

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	Reach 7			SM	Silty sand	17		

Client <u>Battelle</u>		SOIL TECHNOLOGY, INC.
Project <u>Cocheco River Sediments</u>		
Project No. <u>J-1106</u>	Plate <u>7</u>	

Granular Non-Plastic

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

urce:
ple No.: Reach 7
ev. or Depth:
ation:
escription: Silty sand
e:
iquid Limit: Plastic Limit: Natural Moisture: 17
USCS Class.: SM
isting Remarks: Granular Non-Plastic

Mechanical Analysis Data

ive	Size, mm	Percent finer
	4.750	88.0
0	2.000	81.0
8	1.000	71.0
5	0.500	61.0
0	0.250	53.0
20	0.125	44.0
30	0.063	33.0

Hydrometer Analysis Data

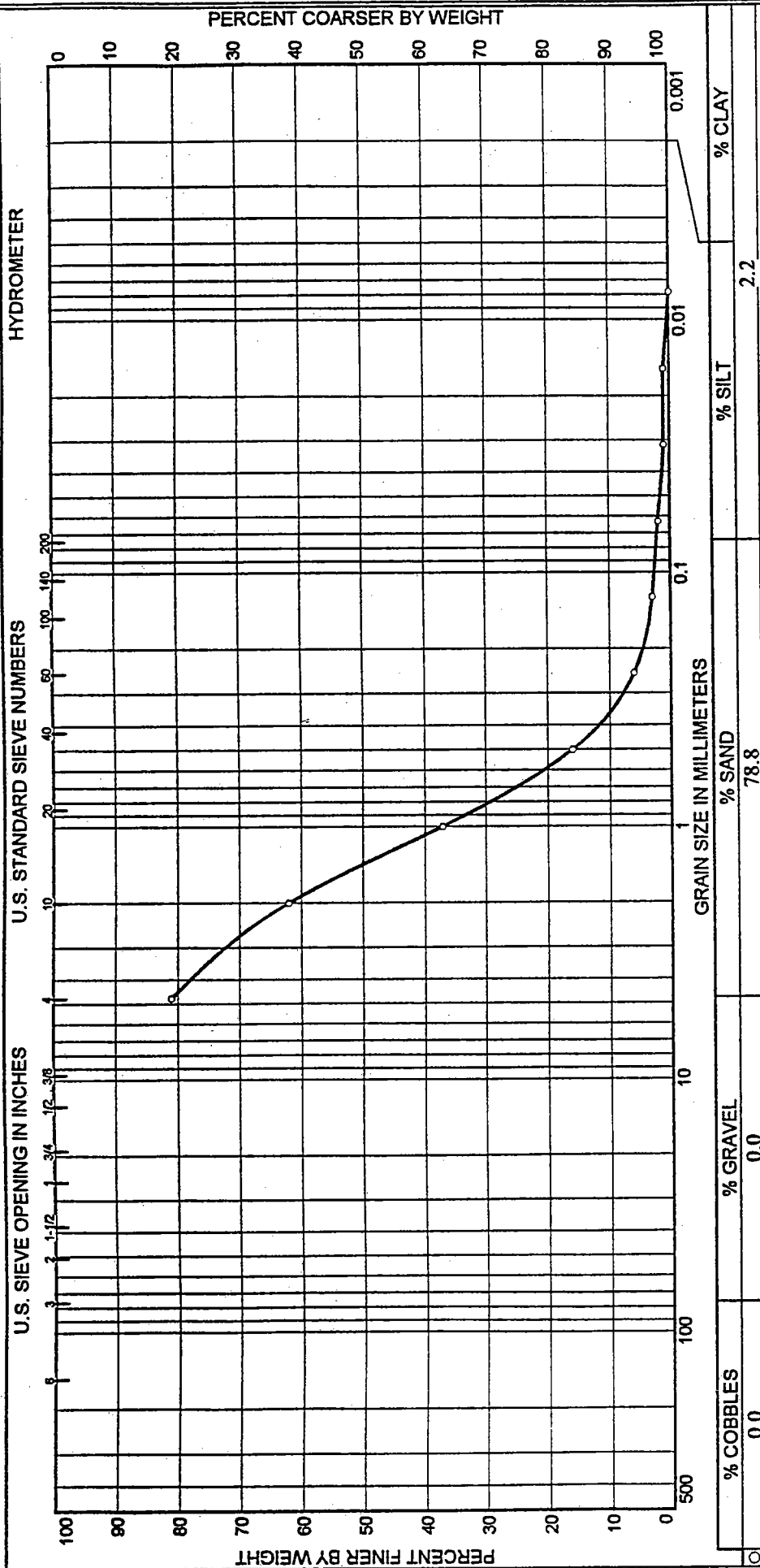
Size, mm	Percent finer
0.0312	22.0
0.0156	15.0
0.0078	11.0
0.0039	8.0
0.0019	7.0
0.0009	5.0

Fractional Components

vel/Sand based on #4
d/Fines based on #200
OBBLER = 0.0 % GRAVEL = 0.0 % SAND = 52.1
ILT = 28.8 % CLAY = 7.1 (% CLAY COLLOIDS = 5.3)

= 3.05 D₆₀= 0.46 D₅₀= 0.19
= 0.05 D₁₅= 0.02 D₁₀= 0.01
0.939 C_u= 72.0943

PARTICLE SIZE DISTRIBUTION TEST REPORT

[illegible]

○ Granular Non-plastic

Client Battelle

Project Cochecho River Sediments

Project No. J-1106

Plate 8

SOIL TECHNOLOGY, INC.

GRAIN SIZE DISTRIBUTION TEST DATA

ent: Battelle
ject: Cocheco River Sediments
ject Number: J-1106

Sample Data

orce:
ple No.: Reach 8
v. or Depth: Sample Length (in./cm.):
ation:
cription: Poorly graded sand with gravel
e: Natural Moisture: 14
uid Limit: Plastic Limit: USCS Class.: SP
ting Remarks: Granular Non-plastic

Mechanical Analysis Data

Size, mm	Percent finer
4.750	81.0
2.000	62.0
1.000	37.0
0.500	16.0
0.250	6.0
0.125	3.0
0.063	2.0

Hydrometer Analysis Data

Size, mm	Percent finer
0.0312	1.0
0.0156	1.0
0.0078	0.0

Fractional Components

el/Sand based on #4
l/Fines based on #200
BBLES = 0.0 % GRAVEL = 0.0 % SAND = 78.8
INES = 2.2

COCHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
1	713907.77	255036.79	05/16/2005	13:04:05	11.0	11.0	1.4		9.6		9.6	0.0	rock
2	713914.85	255024.77	05/16/2005	13:07:28	9.3	9.3	1.4		7.9		7.9	0.0	rock
3	713902.29	255023.72	05/16/2005	13:11:33	9.0	9.0	1.4		7.6		7.6	0.0	rock
4	713900.68	255039.69	05/16/2005	13:12:47	10.5	10.5	1.4		9.1		9.1	0.0	rock
5	713891.66	255021.09	05/16/2005	13:29:58	9.9	9.9	1.2		8.7		8.7	0.0	rock
6	713893.47	255034.00	05/16/2005	13:31:41	11.4	11.4	1.2		10.2		10.2	0.0	rock
7	714373.54	254818.95	05/16/2005	13:55:09	7.2	7.2	1.3		5.9		5.9	0.0	rock
8	714382.97	254819.33	05/16/2005	13:58:04	4.0	4.0	1.3		2.7		2.7	0.0	rock
9	714380.28	254812.78	05/16/2005	13:59:19	7.5	8.0	1.4		6.1		6.6	0.5	sand/gravel to rock
10	714350.95	254862.66	05/16/2005	14:08:15	7.4	7.6	1.5		5.9		6.1	0.2	gravel to rock
11	714357.93	254860.21	05/16/2005	14:10:20	5.0	5.3	1.5		3.5		3.8	0.3	gravel to rock
12	714417.17	254749.91	05/16/2005	14:17:57	9.0	9.0	1.6		7.4		7.4	0.0	rock
13	714659.32	254458.67	05/16/2005	14:31:42	7.0	10.0	1.7		5.3		8.3	3.0	sand
14	714608.68	254498.11	05/16/2005	14:33:02	7.0	11.0	1.7		5.3		9.3	4.0	sand
15	714550.51	254559.38	05/16/2005	14:34:41	7.4	9.0	1.7		5.7		7.3	1.6	sand
16	714813.40	254440.14	05/16/2005	14:37:10	7.0	11.0	1.7		5.3		9.3	4.0	silt to mud
17	714741.54	254443.63	05/16/2005	14:39:02	7.1	9.0	1.7		5.4		7.3	1.9	sand to mud
18	714844.20	254444.44	05/16/2005	14:43:35	6.5	8.7	1.8		4.7		6.9	2.2	mud to hard pan
19	714778.24	254442.19	05/16/2005	14:45:56	6.5	6.5	1.8		4.7		4.7	0.0	rock 3'x5'
20	714770.31	254452.56	05/16/2005	14:49:00	4.8	5.3	1.9		2.9		3.4	0.5	gravel to rock
21	714782.72	254446.58	05/16/2005	14:50:06	4.1	5.0	1.9		2.2		3.1	0.9	sand to gravel
22	714847.61	254439.00	05/16/2005	14:57:10	8.0	10.5	2.2		5.8		8.3	2.5	sand
23	714792.95	254431.81	05/16/2005	14:58:57	8.1	9.5	2.2		5.9		7.3	1.4	sand to hard pan
24	714683.44	254444.12	05/16/2005	15:00:51	8.1	10.0	2.2		5.9		7.8	1.9	sand
25	714618.36	254480.21	05/16/2005	15:02:28	8.0	10.0	2.3		5.7		7.7	2.0	sand
26	714578.09	254538.79	05/16/2005	15:03:48	7.0	8.2	2.3		4.7		5.9	1.2	sand to hard pan
27	714622.95	254502.93	05/16/2005	15:05:28	6.3	10.0	2.3		4.0		7.7	3.7	sand to hard pan
28	714673.96	254468.38	05/16/2005	15:06:52	6.0	9.0	2.3		3.7		6.7	3.0	sand to hard pan
29	714713.82	254448.16	05/16/2005	15:08:28	6.8	10.0	2.4		4.4		7.6	3.2	sand to hard pan
30	714737.70	254434.91	05/16/2005	15:09:32	8.2	11.0	2.4		5.8		8.6	2.8	mud to sand
31	714758.50	254444.16	05/16/2005	15:10:38	7.1	8.4	2.4		4.7		6.0	1.3	sand to hard pan
32	714638.43	254487.74	05/16/2005	15:12:15	6.8	9.0	2.4		4.4		6.6	2.2	sand to hard pan
33	714600.52	254522.06	05/16/2005	15:14:11	6.8	8.8	2.4		4.4		6.4	2.0	sand to hard pan
34	714569.82	254545.88	05/16/2005	15:16:42	7.1	9.0	2.5		4.6		6.5	1.9	sand to hard pan
35	714417.48	254743.39	05/16/2005	15:21:40	11.5	11.5	2.5		9.0		9.0	0.0	rock
36	713701.45	255004.76	05/16/2005	15:31:40	10.0	10.0	2.7		7.3		7.3	0.0	rock
37	713720.14	255009.59	05/16/2005	15:35:25	11.0	11.0	2.8		8.2		8.2	0.0	gravel to hard pan
38	713618.32	255000.81	05/16/2005	15:37:58	10.5	10.5	2.9		7.6		7.6	0.0	gravel to hard pan
39	713607.41	254999.82	05/16/2005	15:38:41	10.0	10.0	2.9		7.1		7.1	0.0	rock
40	713595.69	254992.93	05/16/2005	15:39:43	8.1	8.8	2.9		5.2		5.9	0.7	gravel to rock
41	713586.51	255004.14	05/16/2005	15:40:55	9.0	9.5	3.0		6.0		6.5	0.5	gravel to rock
42	713592.09	254995.16	05/16/2005	15:41:36	7.9	8.0	3.0		4.9		5.0	0.1	gravel to rock
43	713533.35	254989.88	05/16/2005	15:43:18	7.8	8.3	3.0		4.8		5.3	0.5	gravel to hard pan
44	713536.90	255003.42	05/16/2005	15:44:12	9.8	9.8	3.0		6.8		6.8	0.0	rock
45	713505.88	254998.12	05/16/2005	15:45:04	8.8	9.5	3.0		5.8		6.5	0.7	gravel to rock
46	713516.94	254986.03	05/16/2005	15:46:03	7.0	7.0	3.1		3.9		3.9	0.0	rock
47	713533.79	254983.70	05/16/2005	15:47:29	6.2	6.8	3.1		3.1		3.7	0.6	gravel to hard pan
48	713475.97	254983.70	05/16/2005	15:48:58	10.0	10.8	3.1		6.9		7.7	0.8	gravel to hard pan
49	713445.39	255001.07	05/16/2005	15:50:21	10.1	10.1	3.2		6.9		6.9	0.0	rock
50	713439.19	255012.31	05/16/2005	15:51:15	10.1	10.3	3.2		6.9		7.1	0.2	gravel to rock
51	713404.23	255017.24	05/16/2005	15:52:28	11.0	11.0	3.2		7.8		7.8	0.0	rock
52	713392.05	254994.33	05/16/2005	15:53:20	9.4	10.0	3.2		6.2		6.8	0.6	gravel to rock
53	713383.51	254985.85	05/16/2005	15:54:18	10.0	10.1	3.3		6.7		6.8	0.1	gravel to rock
54	713345.19	255023.15	05/16/2005	15:55:33	11.8	11.9	3.3		8.5		8.6	0.1	gravel to rock

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
55	713352.54	255047.38	05/16/2005	15:56:33	11.1	11.2	3.3		7.8		7.9		0.1 gravel to rock
56	713386.31	255034.05	05/16/2005	15:57:29	10.8	11.5	3.4		7.4		8.1		0.7 gravel to rock
57	713352.41	255014.88	05/16/2005	15:58:38	11.1	11.5	3.4		7.7		8.1		0.4 gravel to rock
58	713327.19	255053.82	05/16/2005	15:59:24	11.2	11.5	3.4		7.8		8.1		0.3 gravel to rock
59	713336.62	255060.75	05/16/2005	15:59:57	11.8	12.3	3.4		8.4		8.9		0.5 gravel to hard pan
60	713342.75	255082.49	05/16/2005	16:01:31	10.5	11.0	3.4		7.1		7.6		0.5 gravel to rock
61	713336.80	255099.39	05/16/2005	16:02:19	10.8	10.8	3.5		7.3		7.3		0.0 rock
62	713344.34	255093.29	05/16/2005	16:04:43	10.8	10.9	3.5		7.3		7.4		0.1 gravel to rock
63	713305.80	255098.59	05/16/2005	16:05:31	12.2	13.0	3.5		8.7		9.5		0.8 gravel to hard pan
64	713317.68	255079.48	05/16/2005	16:06:42	12.0	13.0	3.5		8.5		9.5		1.0 mud to hard pan
65	713304.70	255060.53	05/16/2005	16:07:27	12.3	13.5	3.5		8.8		10.0		1.2 mud to hard pan
66	713325.71	255039.45	05/16/2005	16:09:41	11.0	11.0	3.6		7.4		7.4		0.0 rock
67	713283.43	255083.53	05/16/2005	16:10:52	12.8	13.0	3.6		9.2		9.4		0.2 gravel to rock
68	713268.94	255098.38	05/16/2005	16:12:16	12.3	13.0	3.6		8.7		9.4		0.7 mud to rock
69	713247.43	255117.32	05/16/2005	16:13:12	13.0	13.5	3.7		9.3		9.8		0.5 mud to hard pan
70	713450.07	254989.10	05/16/2005	16:26:16	10.1	10.1	4.0		6.1		6.1		0.0 gravel to rock
71	713442.35	254976.20	05/16/2005	16:28:23	11.3	11.5	4.0		7.3		7.5		0.2 gravel to hard pan
72	713496.09	254998.61	05/16/2005	16:30:42	11.0	11.3	4.1		6.9		7.2		0.3 gravel to rock
73	713508.25	255003.58	05/16/2005	16:31:39	10.8	11.2	4.1		6.7		7.1		0.4 gravel to rock
74	714139.43	255019.53	05/17/2005	9:15:24	12.8	13.3	6.6		6.2		6.7		0.5 gravel to rock
75	714105.77	255020.26	05/17/2005	9:19:31	13.2	13.8	6.6		6.6		7.2		0.6 gravel to rock
76	714269.82	254910.28	05/17/2005	9:22:47	12.6	13.4	6.5		6.1		6.9		0.8 gravel to rock
77	714309.11	254855.72	05/17/2005	9:44:06	11.4	14.0	6.0		5.4		8.0		2.6 sand to hard pan
78	714291.69	254864.00	05/17/2005	9:45:11	10.2	14.1	6.0		4.2		8.1		3.9 sand
79	714281.68	254889.33	05/17/2005	9:49:34	10.4	14.2	5.9		4.5		8.3		3.8 sand
80	714321.44	254818.32	05/17/2005	9:51:30	11.3	13.8	5.9		5.4		7.9		2.5 sand to hard pan
81	714352.93	254764.03	05/17/2005	9:52:56	11.8	14.1	5.9		5.9		8.2		2.3 sand to hard pan
82	714342.21	254763.55	05/17/2005	9:54:18	10.6	14.1	5.9		4.7		8.2		3.5 sand
83	714335.49	254778.40	05/17/2005	9:56:40	10.7	13.9	5.8		4.9		8.1		3.2 sand
84	714326.13	254804.16	05/17/2005	9:58:25	10.9	14.1	5.8		5.1		8.3		3.2 sand
85	714305.80	254837.10	05/17/2005	10:00:02	10.3	13.6	5.7		4.6		7.9		3.3 sand
86	714361.31	254733.48	05/17/2005	10:02:11	11.3	11.3	5.7		5.6		5.6		0.0 rock
87	714369.11	254722.40	05/17/2005	10:17:45	11.1	14.8	5.3		5.8		9.5		3.7 sand
88	714395.49	254659.78	05/17/2005	10:19:09	12.0	14.8	5.3		6.7		9.5		2.8 mud to rock
89	714410.43	254692.60	05/17/2005	10:20:30	12.5	13.9	5.2		7.3		8.7		1.4 sand to rock
90	714407.63	254688.53	05/17/2005	10:22:08	12.1	14.0	5.2		6.9		8.8		1.9 sand to hard pan
91	714406.53	254692.98	05/17/2005	10:23:18	11.8	13.8	5.2		6.6		8.6		2.0 sand to rock
92	714406.34	254692.02	05/17/2005	10:26:24	11.9	13.9	5.1		6.8		8.8		2.0 sand to hard pan
93	714412.41	254686.70	05/17/2005	10:28:30	12.8	14.0	5.0		7.8		9.0		1.2 sand to hard pan
94	714425.56	254602.95	05/17/2005	10:30:38	12.0	14.3	5.0		7.0		9.3		2.3 sand to hard pan
95	714441.86	254579.87	05/17/2005	10:33:16	12.2	15.5	4.9		7.3		10.6		3.3 mud
96	714433.60	254588.54	05/17/2005	10:34:54	10.5	12.3	4.9		5.6		7.4		1.8 mud to rock
97	714888.50	254444.87	05/17/2005	10:46:43	9.0	12.4	4.6		4.4		7.8		3.4 mud to rock
98	714905.23	254443.93	05/17/2005	10:49:01	9.9	13.5	4.6		5.3		8.9		3.6 sand to hard pan
99	714906.28	254434.80	05/17/2005	10:50:17	11.1	13.8	4.5		6.6		9.3		2.7 sand to hard pan
100	714989.67	254435.60	05/17/2005	10:52:51	10.2	13.2	4.5		5.7		8.7		3.0 sand to hard pan
101	714971.99	254425.75	05/17/2005	10:54:47	10.9	13.8	4.5		6.4		9.3		2.9 sand to hard pan
102	714982.07	254436.05	05/17/2005	10:56:02	10.2	13.3	4.5		5.7		8.8		3.1 sand to hard pan
103	714996.47	254435.12	05/17/2005	10:57:37	10.0	13.0	4.4		5.6		8.6		3.0 sand to hard pan
104	714975.77	254433.48	05/17/2005	11:00:25	10.5	13.8	4.4		6.1		9.4		3.3 sand
105	714965.04	254382.04	05/17/2005	11:03:41	10.0	10.9	4.3		5.7		6.6		0.9 gravel to rock
106	715217.88	254459.42	05/17/2005	11:10:57	9.5	12.6	4.1		5.4		8.5		3.1 sand to hard pan
107	715183.40	254454.47	05/17/2005	11:14:32	9.8	13.6	4.0		5.8		9.6		3.8 sand to hard pan
108	715148.45	254448.42	05/17/2005	11:16:12	10.1	13.1	4.0		6.1		9.1		3.0 sand to hard pan
109	715139.06	254445.85	05/17/2005	11:18:29	9.9	13.8	4.0		5.9		9.8		3.9 sand to hard pan

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
110	715142.80	254441.27	05/17/2005	11:20:17	10.2	12.9	3.9		6.3		9.0	2.7	sand to hard pan
111	715141.30	254449.58	05/17/2005	11:21:47	9.6	14.3	3.9		5.7		10.4	4.7	sand to hard pan
112	715247.06	254466.37	05/17/2005	11:23:35	9.4	12.4	3.9		5.5		8.5	3.0	sand to hard pan
113	715287.54	254472.16	05/17/2005	11:25:32	9.3	12.7	3.8		5.5		8.9	3.4	sand to hard pan
114	715337.02	254485.23	05/17/2005	11:29:10	9.8	12.0	3.8		6.0		8.2	2.2	sand to rock
115	715398.12	254498.81	05/17/2005	11:31:38	9.6	13.0	3.7		5.9		9.3	3.4	sand to hard pan
116	715487.08	254515.46	05/17/2005	11:33:11	9.8	12.5	3.6		6.2		8.9	2.7	sand to hard pan
117	715510.42	254516.03	05/17/2005	11:34:39	10.0	12.2	3.6		6.4		8.6	2.2	sand to rock
118	715522.82	254522.38	05/17/2005	11:36:26	9.0	15.0	3.6		5.4		11.4	6.0	mud
119	715563.25	254518.17	05/17/2005	11:38:42	10.0	14.1	3.5		6.5		10.6	4.1	sand to hard pan
120	715547.63	254517.15	05/17/2005	11:40:57	9.9	11.8	3.5		6.4		8.3	1.9	sand to hard pan
121	715571.34	254462.79	05/17/2005	11:44:08	8.9	12.2	3.4		5.5		8.8	3.3	sand to hard pan
122	715535.76	254466.88	05/17/2005	11:45:45	9.2	12.0	3.4		5.8		8.6	2.8	sand to hard pan
123	715510.28	254460.33	05/17/2005	11:48:21	8.7	12.1	3.3		5.4		8.8	3.4	sand to hard pan
124	715468.89	254454.67	05/17/2005	11:50:51	8.7	13.0	3.3		5.4		9.7	4.3	sand to hard pan
125	715455.03	254452.94	05/17/2005	11:54:36	9.2	13.1	3.2		6.0		9.9	3.9	sand to hard pan
126	715439.57	254445.25	05/17/2005	11:56:57	8.8	12.2	3.2		5.6		9.0	3.4	sand to hard pan
127	715440.22	254453.52	05/17/2005	11:59:09	8.9	13.2	3.1		5.8		10.1	4.3	sand to hard pan
128	715473.95	254468.39	05/17/2005	12:01:58	9.2	11.7	3.0		6.2		8.7	2.5	sand to hard pan
129	715472.62	254475.77	05/17/2005	12:03:40	9.3	12.2	3.0		6.3		9.2	2.9	sand to hard pan
130	715471.67	254473.38	05/17/2005	12:05:49	9.4	11.7	3.0		6.4		8.7	2.3	sand to hard pan
131	715386.92	254438.87	05/17/2005	12:08:09	11.0	12.2	2.9		8.1		9.3	1.2	sand to hard pan
132	715365.30	254430.53	05/17/2005	12:10:54	12.0	12.0	2.9		9.1		9.1	0.0	rock
133	715351.55	254431.54	05/17/2005	12:12:08	10.0	10.1	2.8		7.2		7.3	0.1	gravel to rock
134	715322.46	254428.21	05/17/2005	12:13:19	6.8	6.8	2.8		4.0		4.0	0.0	rock
135	715310.15	254431.20	05/17/2005	12:15:02	9.8	12.0	2.8		7.0		9.2	2.2	sand to rock
136	715316.61	254429.35	05/17/2005	12:15:45	5.0	5.0	2.8		2.2		2.2	0.0	rock
137	715319.43	254435.55	05/17/2005	12:19:17	7.3	7.3	2.7		4.6		4.6	0.0	rock
138	715323.52	254430.29	05/17/2005	12:21:46	5.8	5.8	2.6		3.2		3.2	0.0	rock
139	715306.88	254424.76	05/17/2005	12:23:15	8.8	11.3	2.6		6.2		8.7	2.5	sand to rock
140	715316.53	254424.59	05/17/2005	12:24:26	5.0	5.0	2.6		2.4		2.4	0.0	rock
141	715060.05	254378.02	05/17/2005	12:26:56	6.3	6.3	2.5		3.8		3.8	0.0	rock
142	715069.29	254378.01	05/17/2005	12:29:06	8.2	8.2	2.5		5.7		5.7	0.0	rock
143	715081.32	254381.03	05/17/2005	12:30:26	7.4	7.4	2.4		5.0		5.0	0.0	rock
144	715070.05	254384.43	05/17/2005	12:31:29	10.6	12.0	2.4		8.2		9.6	1.4	sand to rock
145	715076.15	254381.90	05/17/2005	12:34:00	8.0	8.0	2.4		5.6		5.6	0.0	rock
146	715077.78	254386.28	05/17/2005	12:35:02	10.0	10.5	2.4		7.6		8.1	0.5	sand to rock
147	715089.82	254379.17	05/17/2005	12:36:10	8.2	8.2	2.3		5.9		5.9	0.0	rock
148	715011.80	254382.36	05/17/2005	12:40:02	7.5	7.5	2.2		5.3		5.3	0.0	rock
149	714999.59	254383.57	05/17/2005	12:43:16	9.0	9.0	2.2		6.8		6.8	0.0	rock
150	714914.64	254387.32	05/17/2005	12:46:14	10.0	10.2	2.2		7.8		8.0	0.2	gravel to rock
151	715031.97	254376.74	05/18/2005	10:45:29	9.0	9.7	5.8		3.2		3.9	0.7	gravel to rock
152	715036.40	254384.43	05/18/2005	10:46:54	10.9	12.0	5.8		5.1		6.2	1.1	gravel to hard pan
153	714979.93	254380.88	05/18/2005	10:48:39	12.9	13.8	5.7		7.2		8.1	0.9	gravel to hard pan
154	714937.87	254384.55	05/18/2005	10:50:20	11.3	12.0	5.7		5.6		6.3	0.7	gravel to hard pan
155	714921.18	254387.52	05/18/2005	10:52:15	13.8	14.2	5.7		8.1		8.5	0.4	gravel to rock
156	714906.93	254384.33	05/18/2005	10:54:09	14.9	15.0	5.6		9.3		9.4	0.1	gravel to rock
157	714948.83	254385.90	05/18/2005	10:56:30	11.9	12.8	5.6		6.3		7.2	0.9	gravel to rock
158	715989.89	254276.73	05/18/2005	11:10:05	11.4	13.6	5.3		6.1		8.3	2.2	sand
159	715956.00	254299.07	05/18/2005	11:11:54	11.0	14.5	5.2		5.8		9.3	3.5	sand
160	715940.26	254305.68	05/18/2005	11:13:08	11.6	13.5	5.2		6.4		8.3	1.9	sand to rock
161	715901.30	254324.92	05/18/2005	11:14:40	10.8	14.3	5.2		5.6		9.1	3.5	sand to rock
162	715857.53	254345.74	05/18/2005	11:16:17	11.7	15.0	5.2		6.5		9.8	3.3	sand to mud
163	715842.61	254355.94	05/18/2005	11:17:30	11.6	15.5	5.1		6.5		10.4	3.9	sand to hard pan
164	715853.49	254353.55	05/18/2005	11:20:17	11.7	13.9	5.0		6.7		8.9	2.2	sand to rock

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
165	715847.62	254356.72	05/18/2005	11:21:23	11.7	14.5	5.0		6.7		9.5	2.8	sand to rock
166	715806.83	254370.38	05/18/2005	11:22:50	11.0	13.9	5.0		6.0		8.9	2.9	sand to hard pan
167	715741.18	254407.33	05/18/2005	11:24:10	10.5	14.2	5.0		5.5		9.2	3.7	sand to hard pan
168	715700.95	254430.50	05/18/2005	11:25:12	10.9	14.2	4.9		6.0		9.3	3.3	sand to rock
169	715670.60	254444.70	05/18/2005	11:26:18	10.1	14.3	4.9		5.2		9.4	4.2	sand to hard pan
170	715632.12	254454.14	05/18/2005	11:27:27	10.5	14.7	4.9		5.6		9.8	4.2	sand to hard pan
171	715599.57	254462.22	05/18/2005	11:28:37	10.3	14.4	4.8		5.5		9.6	4.1	sand to hard pan
172	715594.33	254478.56	05/18/2005	11:29:22	11.2	13.5	4.8		6.4		8.7	2.3	sand to rock
173	715602.93	254489.89	05/18/2005	11:30:26	10.5	11.5	4.8		5.7		6.7	1.0	gravel to rock
174	715606.87	254474.90	05/18/2005	11:33:03	10.9	13.8	4.7		6.2		9.1	2.9	sand to rock
175	715614.96	254463.29	05/18/2005	11:34:56	10.4	13.7	4.7		5.7		9.0	3.3	mud to hard pan
176	715616.92	254453.15	05/18/2005	11:37:23	10.3	13.9	4.6		5.7		9.3	3.6	sand to hard pan
177	715615.31	254452.11	05/18/2005	11:38:33	10.1	14.0	4.6		5.5		9.4	3.9	sand to hard pan
178	715614.08	254452.63	05/18/2005	11:40:01	10.0	13.7	4.6		5.4		9.1	3.7	sand to hard pan
179	715676.45	254483.75	05/18/2005	11:43:16	11.0	11.1	4.5		6.5		6.6	0.1	gravel to rock
180	715679.12	254495.93	05/18/2005	11:44:56	11.4	11.8	4.5		6.9		7.3	0.4	mud to rock
181	715681.26	254494.89	05/18/2005	11:46:41	11.2	12.9	4.4		6.8		8.5	1.7	sand to hard pan
182	715675.81	254501.95	05/18/2005	11:48:51	11.2	13.9	4.4		6.8		9.5	2.7	mud to rock
183	716129.41	254269.22	05/18/2005	11:52:15	10.5	10.5	4.3		6.2		6.2	0.0	rock
184	716138.18	254265.48	05/18/2005	11:53:14	11.5	12.5	4.3		7.2		8.2	1.0	mud to rock
185	716124.19	254273.82	05/18/2005	11:54:21	11.5	13.3	4.3		7.2		9.0	1.8	mud to rock
186	716075.33	254302.12	05/18/2005	11:56:33	8.8	9.0	4.2		4.6		4.8	0.2	mud to rock
187	716074.49	254300.72	05/18/2005	11:59:35	10.4	12.4	4.1		6.3		8.3	2.0	mud to hard pan
188	716071.53	254301.04	05/18/2005	12:01:35	10.2	12.0	4.1		6.1		7.9	1.8	gravel to rock
189	717084.91	253549.50	05/18/2005	13:06:18	9.1	10.3	2.7		6.4		7.6	1.2	sand to hard pan
190	717076.30	253560.96	05/18/2005	13:07:23	9.2	10.2	2.7		6.5		7.5	1.0	sand to hard pan
191	717080.47	253555.93	05/18/2005	13:08:17	9.2	10.2	2.7		6.5		7.5	1.0	sand to hard pan
192	717037.82	253582.62	05/18/2005	13:11:09	7.2	9.3	2.6		4.6		6.7	2.1	sand to hard pan
193	717033.52	253587.68	05/18/2005	13:12:20	7.2	9.4	2.6		4.6		6.8	2.2	sand to hard pan
194	717007.71	253609.01	05/18/2005	13:13:36	8.2	9.9	2.5		5.7		7.4	1.7	sand to hard pan
195	716988.21	253627.49	05/18/2005	13:14:55	8.2	9.9	2.5		5.7		7.4	1.7	sand to hard pan
196	716988.53	253635.73	05/18/2005	13:16:24	8.8	10.5	2.5		6.3		8.0	1.7	mud to hard pan
197	716969.41	253653.28	05/18/2005	13:17:38	8.5	10.8	2.4		6.1		8.4	2.3	mud to hard pan
198	716955.63	253652.16	05/18/2005	13:19:15	7.5	9.3	2.4		5.1		6.9	1.8	sand to hard pan
199	716932.71	253680.13	05/18/2005	13:21:15	8.2	10.2	2.4		5.8		7.8	2.0	sand to hard pan
200	716924.16	253675.69	05/18/2005	13:22:47	6.7	9.4	2.4		4.3		7.0	2.7	sand to hard pan
201	716928.60	253672.75	05/18/2005	13:25:01	7.0	7.0	2.3		4.7		4.7	0.0	rock
202	716905.96	253692.76	05/18/2005	13:28:04	6.0	6.0	2.2		3.8		3.8	0.0	rock
203	716844.57	253750.00	05/19/2005	9:39:35	11.9	15.1	6.9		5.0		8.2	3.2	mud to hard pan
204	716827.70	253779.30	05/19/2005	9:41:40	11.8	15.5	6.9		4.9		8.6	3.7	mud to sand
205	716790.29	253807.00	05/19/2005	9:43:22	11.3	15.1	6.9		4.4		8.2	3.8	sand to hard pan
206	716761.22	253833.69	05/19/2005	9:44:55	11.3	13.5	6.9		4.4		6.6	2.2	mud to rock
207	716777.25	253857.40	05/19/2005	9:46:14	12.0	16.0	7.0		5.0		9.0	4.0	sand
208	716736.87	253858.34	05/19/2005	9:48:17	11.3	16.5	7.0		4.3		9.5	5.2	mud
209	716704.18	253883.64	05/19/2005	9:49:28	11.3	15.3	7.0		4.3		8.3	4.0	mud to hard pan
210	716695.14	253910.46	05/19/2005	9:51:09	11.9	15.8	7.0		4.9		8.8	3.9	sand to hard pan
211	716677.69	253933.71	05/19/2005	9:52:19	12.4	14.6	7.0		5.4		7.6	2.2	sand to hard pan
212	716641.01	253949.34	05/19/2005	9:53:43	12.2	15.2	7.0		5.2		8.2	3.0	sand to hard pan
213	716617.54	253956.11	05/19/2005	9:55:28	12.5	15.5	7.0		5.5		8.5	3.0	mud to hard pan
214	716629.63	253969.55	05/19/2005	9:57:17	12.8	15.1	7.0		5.8		8.1	2.3	sand to hard pan
215	716596.41	253971.61	05/19/2005	9:58:55	12.4	15.8	7.0		5.4		8.8	3.4	mud to hard pan
216	716553.60	253991.72	05/19/2005	10:00:19	12.0	16.0	7.0		5.0		9.0	4.0	sand
217	716518.30	254011.30	05/19/2005	10:01:13	12.8	16.8	7.0		5.8		9.8	4.0	mud to sand
218	716476.52	254030.53	05/19/2005	10:02:30	13.5	17.2	7.0		6.5		10.2	3.7	mud to sand
219	716481.69	254060.02	05/19/2005	10:04:14	14.0	16.8	7.0		7.0		9.8	2.8	mud to hard pan

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NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
220	716418.77	254063.03	05/19/2005	10:05:45	13.0	16.2	7.0		6.0		9.2	3.2	mud to hard pan
221	716355.58	254092.94	05/19/2005	10:07:13	13.2	17.3	7.0		6.2		10.3	4.1	mud to sand
222	716308.38	254115.14	05/19/2005	10:08:32	14.0	16.1	7.0		7.0		9.1	2.1	mud to hard pan
223	716746.70	253898.73	05/19/2005	10:12:30	12.5	15.0	7.0		5.5		8.0	2.5	sand to hard pan
224	716690.95	253946.91	05/19/2005	10:14:47	12.9	15.2	7.0		5.9		8.2	2.3	sand to hard pan
225	716805.20	253826.56	05/19/2005	10:16:37	12.3	17.2	7.0		5.3		10.2	4.9	mud to sand
226	716849.22	253821.90	05/19/2005	10:18:20	13.7	15.0	7.0		6.7		8.0	1.3	sand to hard pan
227	716863.57	253754.24	05/19/2005	10:19:32	12.5	13.1	7.0		5.5		6.1	0.6	mud to rock
228	716888.60	253721.73	05/19/2005	10:20:43	12.8	15.4	7.0		5.8		8.4	2.6	mud to hard pan
229	716885.94	253710.18	05/19/2005	10:21:29	10.5	11.3	7.0		3.5		4.3	0.8	sand to hard pan
230	717082.33	253553.13	05/19/2005	10:25:06	12.3	14.8	6.9		5.4		7.9	2.5	sand to hard pan
231	717084.74	253618.25	05/19/2005	10:26:48	13.5	14.1	6.9		6.6		7.2	0.6	sand to rock
232	717093.19	253616.93	05/19/2005	10:27:54	13.3	14.4	6.9		6.4		7.5	1.1	sand to rock
233	717062.31	253640.57	05/19/2005	10:29:26	13.5	14.3	6.9		6.6		7.4	0.8	gravel to hard pan
234	717073.09	253634.71	05/19/2005	10:31:04	12.9	13.1	6.9		6.0		6.2	0.2	gravel to hard pan
235	717087.99	253623.73	05/19/2005	10:32:15	12.3	12.7	6.9		5.4		5.8	0.4	gravel to rock
236	717098.47	253613.40	05/19/2005	10:33:46	12.8	13.0	6.9		5.9		6.1	0.2	gravel to rock
237	717220.41	253467.49	05/19/2005	10:37:43	12.1	13.8	6.8		5.3		7.0	1.7	sand to hard pan
238	717201.40	253470.84	05/19/2005	10:38:53	12.8	14.4	6.8		6.0		7.6	1.6	mud to hard pan
239	717212.93	253471.60	05/19/2005	10:40:43	12.3	13.5	6.8		5.5		6.7	1.2	sand to rock
240	717208.50	253468.54	05/19/2005	10:42:24	11.8	13.8	6.8		5.0		7.0	2.0	sand to hard pan
241	717223.42	253462.69	05/19/2005	10:45:02	12.3	14.3	6.8		5.5		7.5	2.0	sand to hard pan
242	717207.39	253476.97	05/19/2005	10:46:19	12.5	13.5	6.7		5.8		6.8	1.0	sand to hard pan
243	717185.39	253477.47	05/19/2005	10:47:56	12.4	14.2	6.7		5.7		7.5	1.8	sand to hard pan
244	717208.08	253476.88	05/19/2005	10:49:44	12.6	13.8	6.7		5.9		7.1	1.2	sand to rock
245	717287.68	253497.43	05/19/2005	11:20:55	12.1	13.8	6.3		5.8		7.5	1.7	mud to hard pan
246	717301.03	253489.40	05/19/2005	11:22:03	12.6	15.0	6.2		6.4		8.8	2.4	sand to hard pan
247	717317.88	253483.85	05/19/2005	11:23:33	11.7	14.4	6.2		5.5		8.2	2.7	sand to hard pan
248	717334.79	253477.52	05/19/2005	11:24:49	12.2	15.0	6.2		6.0		8.8	2.8	sand to hard pan
249	717395.11	253418.17	05/19/2005	11:28:26	12.0	12.5	6.1		5.9		6.4	0.5	gravel to rock
250	717381.89	253412.09	05/19/2005	11:29:31	12.4	12.8	6.1		6.3		6.7	0.4	gravel to rock
251	717367.38	253409.09	05/19/2005	11:30:39	10.8	10.8	6.1		4.7		4.7	0.0	rock
252	717352.31	253410.56	05/19/2005	11:31:33	11.3	11.3	6.0		5.3		5.3	0.0	rock
253	717333.50	253419.36	05/19/2005	11:32:55	15.5	15.5	6.0		9.5		9.5	0.0	rock
254	717394.06	253398.61	05/19/2005	11:34:50	8.3	9.1	6.0		2.3		3.1	0.8	gravel to rock
255	717413.14	253388.85	05/19/2005	11:36:10	7.0	7.0	6.0		1.0		1.0	0.0	rock
256	717436.61	253385.71	05/19/2005	11:37:01	9.3	9.5	5.9		3.4		3.6	0.2	gravel to rock
257	717434.86	253402.18	05/19/2005	11:37:59	9.8	10.5	5.9		3.9		4.6	0.7	gravel to rock
258	717420.04	253401.86	05/19/2005	11:39:14	11.8	12.4	5.9		5.9		6.5	0.6	gravel to rock
259	717456.89	253384.39	05/19/2005	11:40:27	10.4	11.0	5.8		4.6		5.2	0.6	gravel to rock
260	717462.08	253370.23	05/19/2005	11:41:22	6.5	6.5	5.8		0.7		0.7	0.0	rock
261	717449.24	253377.82	05/19/2005	11:42:14	8.1	8.3	5.8		2.3		2.5	0.2	gravel to rock
262	717448.03	253394.36	05/19/2005	11:43:01	12.0	12.2	5.7		6.3		6.5	0.2	gravel to rock
263	717437.58	253423.71	05/19/2005	11:43:50	12.7	13.7	5.7		7.0		8.0	1.0	gravel to rock
264	717429.76	253415.55	05/19/2005	11:45:06	11.7	12.0	5.7		6.0		6.3	0.3	gravel to rock
265	717404.69	253411.47	05/19/2005	11:46:21	12.2	12.3	5.7		6.5		6.6	0.1	gravel to rock
266	717466.16	253385.28	05/19/2005	11:48:24	11.4	12.4	5.6		5.8		6.8	1.0	gravel to rock
267	717472.78	253377.97	05/19/2005	11:49:54	12.4	12.4	5.6		6.8		6.8	0.0	rock
268	717475.69	253363.91	05/19/2005	11:51:06	7.3	8.0	5.6		1.7		2.4	0.7	gravel to rock
269	717479.98	253370.36	05/19/2005	11:52:45	10.1	10.1	5.5		4.6		4.6	0.0	rock
270	717475.52	253380.78	05/19/2005	11:53:17	12.3	12.3	5.5		6.8		6.8	0.0	rock
271	717483.38	253416.97	05/19/2005	11:53:59	10.7	10.7	5.4		5.3		5.3	0.0	rock
272	717465.99	253421.04	05/19/2005	11:54:48	11.5	11.7	5.4		6.1		6.3	0.2	gravel to rock
273	717446.99	253431.66	05/19/2005	11:56:04	11.2	11.3	5.4		5.8		5.9	0.1	gravel to rock

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
274	717432.21	253441.45	05/19/2005	11:57:06	11.1	11.1	5.4		5.7		5.7	0.0	rock
275	717422.39	253436.61	05/19/2005	11:57:45	11.5	11.5	5.4		6.1		6.1	0.0	rock
276	717410.63	253449.58	05/19/2005	11:59:14	11.9	13.0	5.4		6.5		7.6	1.1	gravel to hard pan
277	717415.75	253443.10	05/19/2005	12:02:20	11.0	11.0	5.3		5.7		5.7	0.0	rock
278	717393.45	253426.07	05/19/2005	12:04:07	11.5	12.3	5.3		6.2		7.0	0.8	gravel to rock
279	717522.15	253344.00	05/19/2005	12:06:23	10.0	15.0	5.2		4.8		9.8	5.0	mud to rock
280	717498.99	253354.35	05/19/2005	12:07:07	10.4	10.5	5.2		5.2		5.3	0.1	gravel to rock
281	717489.04	253358.91	05/19/2005	12:09:00	8.0	8.0	5.1		2.9		2.9	0.0	rock
282	717503.64	253357.22	05/19/2005	12:10:06	12.5	12.7	5.1		7.4		7.6	0.2	mud to rock
283	717533.01	253345.10	05/19/2005	12:11:03	12.1	15.2	5.1		7.0		10.1	3.1	mud
284	717545.75	253336.83	05/19/2005	12:12:35	9.1	10.5	5.0		4.1		5.5	1.4	mud to rock
285	717554.87	253333.14	05/19/2005	12:13:43	11.0	14.8	5.0		6.0		9.8	3.8	mud
286	717580.81	253325.23	05/19/2005	12:14:58	11.2	11.7	5.0		6.2		6.7	0.5	sand to rock
287	717579.20	253320.99	05/19/2005	12:17:17	8.4	9.4	4.9		3.5		4.5	1.0	mud to rock
288	717583.99	253324.98	05/19/2005	12:19:49	10.5	10.5	4.9		5.6		5.6	0.0	rock
289	717591.37	253320.21	05/19/2005	12:22:18	10.8	11.3	4.8		6.0		6.5	0.5	mud to rock
290	717584.51	253329.43	05/19/2005	12:23:27	10.8	10.9	4.8		6.0		6.1	0.1	mud to rock
291	717541.85	253340.71	05/19/2005	12:24:39	11.4	15.1	4.8		6.6		10.3	3.7	sand to mud
292	717563.88	253334.27	05/19/2005	12:26:05	10.9	15.0	4.7		6.2		10.3	4.1	sand to mud
293	717563.59	253329.00	05/19/2005	12:27:17	9.3	14.4	4.7		4.6		9.7	5.1	sand to mud to rock
294	717575.89	253330.08	05/19/2005	12:28:33	10.7	11.7	4.7		6.0		7.0	1.0	sand to rock
295	717669.63	253286.80	05/19/2005	13:00:19	10.8	10.8	4.0		6.8		6.8	0.0	rock
296	717642.16	253296.66	05/19/2005	13:01:17	9.9	9.9	4.0		5.9		5.9	0.0	rock
297	717627.57	253303.63	05/19/2005	13:02:43	9.7	9.7	3.9		5.8		5.8	0.0	rock
298	717592.07	253314.56	05/19/2005	13:03:40	8.8	8.8	3.9		4.9		4.9	0.0	rock
299	717622.17	253309.19	05/19/2005	13:05:04	10.8	10.8	3.9		6.9		6.9	0.0	rock
300	717604.94	253313.29	05/19/2005	13:05:44	9.3	10.3	3.8		5.5		6.5	1.0	gravel to rock
301	717615.79	253306.99	05/19/2005	13:07:03	9.8	9.8	3.8		6.0		6.0	0.0	rock
302	717600.94	253319.78	05/19/2005	13:07:31	11.1	11.6	3.8		7.3		7.8	0.5	sand to rock
303	717700.38	253275.50	05/19/2005	13:09:16	10.9	11.9	3.8		7.1		8.1	1.0	mud to rock
304	717710.16	253271.12	05/19/2005	13:10:15	11.1	11.1	3.8		7.3		7.3	0.0	rock
305	717713.64	253272.58	05/19/2005	13:11:11	11.3	11.7	3.7		7.6		8.0	0.4	mud to rock
306	717725.31	253265.09	05/19/2005	13:12:23	8.2	8.2	3.7		4.5		4.5	0.0	rock
307	717730.28	253264.27	05/19/2005	13:13:31	9.6	9.6	3.7		5.9		5.9	0.0	rock
308	717733.45	253258.76	05/19/2005	13:14:25	9.4	9.7	3.7		5.7		6.0	0.3	gravel to rock
309	717734.62	253261.98	05/19/2005	13:15:49	9.5	9.5	3.6		5.9		5.9	0.0	rock
310	717727.35	253269.55	05/19/2005	13:16:36	9.8	9.8	3.6		6.2		6.2	0.0	rock
311	717794.02	253237.49	05/19/2005	13:18:25	9.2	9.2	3.6		5.6		5.6	0.0	rock
312	717777.33	253244.60	05/19/2005	13:19:25	8.2	8.2	3.6		4.6		4.6	0.0	rock
313	717782.27	253250.19	05/19/2005	13:20:44	9.4	9.4	3.5		5.9		5.9	0.0	rock
314	717765.95	253250.12	05/19/2005	13:21:40	9.2	9.2	3.5		5.7		5.7	0.0	rock
315	717777.23	253253.57	05/19/2005	13:22:19	10.8	10.8	3.5		7.3		7.3	0.0	rock
316	717787.31	253242.94	05/19/2005	13:23:46	9.2	9.2	3.4		5.8		5.8	0.0	rock
317	717788.44	253247.60	05/19/2005	13:25:33	10.3	10.3	3.4		6.9		6.9	0.0	rock
318	717798.34	253238.01	05/19/2005	13:26:13	9.1	9.1	3.4		5.7		5.7	0.0	rock
319	717793.14	253295.32	05/20/2005	9:48:30	14.5	15.5	6.8		7.7		8.7	1.0	gravel to rock
320	717806.37	253290.23	05/20/2005	9:49:49	14.3	14.3	6.9		7.4		7.4	0.0	rock
321	717803.06	253293.56	05/20/2005	9:51:02	14.3	14.4	6.9		7.4		7.5	0.1	gravel to rock
322	717808.79	253291.97	05/20/2005	9:52:12	14.5	15.5	6.9		7.6		8.6	1.0	mud to rock
323	717853.55	253276.14	05/20/2005	9:53:49	13.2	13.2	6.9		6.3		6.3	0.0	rock
324	717836.13	253280.58	05/20/2005	9:54:54	13.6	13.9	7.0		6.6		6.9	0.3	gravel to rock
325	717827.43	253285.78	05/20/2005	9:57:38	12.0	12.0	7.0		5.0		5.0	0.0	rock
326	717819.18	253285.78	05/20/2005	9:59:42	14.2	14.2	7.0		7.2		7.2	0.0	mud to rock
327	717890.49	253257.56	05/20/2005	10:00:50	11.2	11.2	7.0		4.2		4.2	0.0	rock

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
328	717861.60	253270.86	05/20/2005	10:01:58	13.0	13.1	7.0		6.0		6.1	0.1	gravel to rock
329	717870.44	253261.55	05/20/2005	10:02:47	13.8	14.1	7.0		6.8		7.1	0.3	gravel to rock
330	717872.34	253254.73	05/20/2005	10:03:41	14.9	15.2	7.0		7.9		8.2	0.3	gravel to rock
331	717876.82	253244.41	05/20/2005	10:04:26	16.0	18.5	7.0		9.0		11.5	2.5	gravel to rock
332	717879.56	253251.38	05/20/2005	10:05:54	15.0	15.0	7.0		8.0		8.0	0.0	rock
333	717879.10	253261.33	05/20/2005	10:07:49	12.0	12.0	7.0		5.0		5.0	0.0	rock
334	717904.79	253250.94	05/20/2005	10:08:57	11.8	11.8	7.0		4.8		4.8	0.0	rock
335	717937.56	253235.47	05/20/2005	10:09:59	14.1	14.2	7.0		7.1		7.2	0.1	gravel to rock
336	717923.06	253241.43	05/20/2005	10:10:41	13.9	14.2	7.0		6.9		7.2	0.3	gravel to rock
337	717905.78	253250.05	05/20/2005	10:12:07	13.0	13.1	7.0		6.0		6.1	0.1	gravel to rock
338	717886.82	253260.30	05/20/2005	10:13:55	11.3	11.3	7.0		4.3		4.3	0.0	rock
339	717898.71	253252.41	05/20/2005	10:15:13	12.6	14.0	7.0		5.6		7.0	1.4	gravel to rock
340	717910.79	253246.28	05/20/2005	10:16:51	13.7	13.7	7.0		6.7		6.7	0.0	rock
341	717889.69	253255.52	05/20/2005	10:18:01	14.4	14.8	7.0		7.4		7.8	0.4	gravel to rock
342	717858.05	253269.95	05/20/2005	10:21:30	12.2	13.7	7.1		5.1		6.6	1.5	gravel to rock
343	717865.12	253272.02	05/20/2005	10:23:49	10.7	10.7	7.1		3.6		3.6	0.0	rock
344	717979.27	253210.58	05/20/2005	10:26:45	12.5	12.7	7.1		5.4		5.6	0.2	gravel to rock
345	717970.79	253214.74	05/20/2005	10:27:57	10.8	10.8	7.1		3.7		3.7	0.0	rock
346	717967.84	253217.50	05/20/2005	10:29:24	11.8	11.8	7.1		4.7		4.7	0.0	rock
347	718125.57	253115.24	05/20/2005	10:31:41	15.2	15.2	7.1		8.1		8.1	0.0	rock
348	718190.37	253031.88	05/20/2005	10:41:49	15.3	15.3	7.1		8.2		8.2	0.0	rock
349	718190.06	253034.92	05/20/2005	10:43:16	15.8	15.8	7.1		8.7		8.7	0.0	rock
350	718110.13	253115.97	05/20/2005	10:44:57	13.8	13.8	7.1		6.7		6.7	0.0	rock
351	718109.78	253123.83	05/20/2005	10:45:56	14.2	14.2	7.1		7.1		7.1	0.0	rock
352	718102.89	253137.86	05/20/2005	10:46:35	14.1	14.1	7.1		7.0		7.0	0.0	rock
353	718087.82	253146.61	05/20/2005	10:47:27	14.8	15.2	7.1		7.7		8.1	0.4	gravel to rock
354	718064.69	253158.38	05/20/2005	10:48:58	13.9	13.9	7.1		6.8		6.8	0.0	rock
355	718052.99	253164.39	05/20/2005	10:49:49	14.8	14.8	7.1		7.7		7.7	0.0	rock
356	718032.13	253177.89	05/20/2005	10:51:45	12.9	13.1	7.1		5.8		6.0	0.2	gravel to rock
357	718011.36	253191.79	05/20/2005	10:53:05	13.0	13.0	7.1		5.9		5.9	0.0	rock
358	718056.24	253158.71	05/20/2005	10:54:14	15.2	15.2	7.1		8.1		8.1	0.0	rock
359	718079.93	253143.72	05/20/2005	10:55:31	14.7	15.0	7.1		7.6		7.9	0.3	gravel to rock
360	718113.29	253127.61	05/20/2005	10:56:34	13.6	13.6	7.1		6.5		6.5	0.0	rock
361	718120.27	253119.89	05/20/2005	10:58:04	14.2	14.5	7.1		7.1		7.4	0.3	gravel to rock
362	718332.36	252867.03	05/20/2005	11:01:38	13.1	13.1	7.1		6.0		6.0	0.0	rock
363	718329.31	252868.30	05/20/2005	11:03:49	14.3	14.3	7.1		7.2		7.2	0.0	rock
364	718330.49	252866.44	05/20/2005	11:04:48	14.3	14.3	7.1		7.2		7.2	0.0	rock
365	718721.69	252514.39	05/20/2005	11:09:25	14.2	18.8	7.1		7.1		11.7	4.6	mud to rock
366	719141.87	252440.45	05/20/2005	11:14:14	12.3	16.7	7.0		5.3		9.7	4.4	mud to sand
367	719102.73	252446.33	05/20/2005	11:15:20	12.2	17.0	7.0		5.2		10.0	4.8	mud to sand
368	719076.11	252445.12	05/20/2005	11:16:44	12.5	16.0	7.0		5.5		9.0	3.5	gravel to rock
369	719041.85	252454.65	05/20/2005	11:18:09	11.9	17.5	7.0		4.9		10.5	5.6	mud to sand to hard pan
370	719019.85	252449.68	05/20/2005	11:19:30	12.9	16.5	7.0		5.9		9.5	3.6	mud to sand to hard pan
371	718995.01	252453.29	05/20/2005	11:21:08	12.4	15.7	7.0		5.4		8.7	3.3	mud to sand to hard pan
372	718962.79	252469.96	05/20/2005	11:22:18	11.4	17.8	6.9		4.5		10.9	6.4	mud
373	718930.34	252459.25	05/20/2005	11:23:33	12.6	17.8	6.9		5.7		10.9	5.2	mud
374	718924.28	252470.34	05/20/2005	11:24:45	12.4	17.8	6.9		5.5		10.9	5.4	mud
375	718898.00	252465.92	05/20/2005	11:26:45	12.4	15.0	6.9		5.5		8.1	2.6	mud
376	718899.12	252478.15	05/20/2005	11:27:26	11.8	17.8	6.9		4.9		10.9	6.0	mud
377	718841.32	252487.91	05/20/2005	11:28:34	12.3	18.0	6.9		5.4		11.1	5.7	mud
378	718824.43	252486.12	05/20/2005	11:29:55	12.8	18.0	6.9		5.9		11.1	5.2	mud
379	718776.42	252497.17	05/20/2005	11:31:12	13.0	18.0	6.9		6.1		11.1	5.0	mud
380	719453.76	252324.08	05/20/2005	11:36:27	12.7	13.7	6.8		5.9		6.9	1.0	mud to rock
381	719378.80	252340.62	05/20/2005	11:38:01	12.4	12.7	6.8		5.6		5.9	0.3	mud to rock
382	719346.63	252341.07	05/20/2005	11:39:30	11.7	11.7	6.8		4.9		4.9	0.0	rock

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
383	719316.86	252349.64	05/20/2005	11:40:38	11.4	11.4	6.8		4.6		4.6	0.0	rock
384	719310.06	252353.84	05/20/2005	11:41:34	11.3	11.3	6.8		4.5		4.5	0.0	rock
385	719295.19	252347.66	05/20/2005	11:42:16	11.1	11.1	6.8		4.3		4.3	0.0	rock
386	719265.00	252361.25	05/20/2005	11:43:18	12.2	12.3	6.8		5.4		5.5	0.1	rock
387	719269.93	252366.03	05/20/2005	11:43:56	12.1	12.1	6.8		5.3		5.3	0.0	rock
388	719253.25	252357.87	05/20/2005	11:45:38	12.8	13.2	6.7		6.1		6.5	0.4	gravel to sand to rock
389	719197.94	252362.74	05/20/2005	11:48:04	13.2	13.7	6.7		6.5		7.0	0.5	sand to rock
390	719232.22	252364.97	05/20/2005	11:48:51	13.3	13.3	6.7		6.6		6.6	0.0	rock
391	719634.68	252353.01	05/20/2005	11:53:00	13.0	15.4	6.7		6.3		8.7	2.4	mud to hard pan
392	719609.26	252366.89	05/20/2005	11:54:00	12.3	16.8	6.7		5.6		10.1	4.5	mud to hard pan
393	719621.42	252364.54	05/20/2005	11:55:29	12.0	16.2	6.6		5.4		9.6	4.2	mud to hard pan
394	719613.24	252369.52	05/20/2005	11:56:14	11.2	15.2	6.6		4.6		8.6	4.0	mud to hard pan
395	719599.90	252371.83	05/20/2005	11:58:32	12.3	17.2	6.6		5.7		10.6	4.9	mud to hard pan
396	719595.10	252371.38	05/20/2005	11:59:52	13.7	17.4	6.6		7.1		10.8	3.7	mud to hard pan
397	719850.33	251924.06	05/20/2005	12:29:59	11.7	16.5	6.0		5.7		10.5	4.8	mud to sand
398	719789.65	252042.76	05/20/2005	12:32:37	10.7	14.1	5.9		4.8		8.2	3.4	sand to hard pan
399	719761.16	252107.77	05/20/2005	12:33:55	10.6	15.0	5.9		4.7		9.1	4.4	sand to hard pan
400	719761.19	252098.68	05/20/2005	12:35:40	10.5	15.8	5.8		4.7		10.0	5.3	sand
401	719769.37	252101.29	05/20/2005	12:36:50	10.8	15.0	5.8		5.0		9.2	4.2	sand to hard pan
402	719747.69	252144.61	05/20/2005	12:38:14	10.8	13.9	5.8		5.0		8.1	3.1	sand to hard pan
403	719752.41	252169.60	05/20/2005	12:39:21	12.2	15.6	5.7		6.5		9.9	3.4	sand to hard pan
404	719703.09	252203.28	05/20/2005	12:40:35	11.2	14.8	5.7		5.5		9.1	3.6	sand to hard pan
405	719673.46	252232.40	05/20/2005	12:41:41	11.2	15.1	5.7		5.5		9.4	3.9	sand to hard pan
406	719651.36	252249.66	05/20/2005	12:42:48	11.4	15.2	5.6		5.8		9.6	3.8	sand to hard pan
407	719621.40	252271.95	05/20/2005	12:44:54	11.4	15.2	5.6		5.8		9.6	3.8	sand to hard pan
408	719744.86	252160.25	05/20/2005	12:46:30	10.8	14.9	5.5		5.3		9.4	4.1	sand to hard pan
409	719861.23	251890.99	05/20/2005	12:48:53	11.0	15.3	5.5		5.5		9.8	4.3	mud to hard pan
410	719812.16	252001.58	05/20/2005	12:50:08	10.2	15.5	5.4		4.8		10.1	5.3	sand
411	720579.90	251127.39	05/20/2005	12:54:44	17.0	18.0	5.3	11.7			12.7	1.0	mud
412	720571.82	251140.76	05/20/2005	12:58:08	11.4	17.0	5.3		6.1		11.7	5.6	mud
413	720556.52	251166.60	05/20/2005	12:59:19	11.3	17.0	5.2		6.1		11.8	5.7	mud
414	720532.73	251218.15	05/20/2005	13:01:05	10.3	16.5	5.2		5.1		11.3	6.2	mud
415	720505.66	251275.51	05/20/2005	13:02:38	10.8	16.3	5.1		5.7		11.2	5.5	mud
416	720463.51	251345.38	05/20/2005	13:04:10	10.5	11.0	5.1		5.4		5.9	0.5	hard pan/clay
417	720451.20	251372.23	05/20/2005	13:06:13	8.8	10.0	5.1		3.7		4.9	1.2	sand to clay
418	720418.10	251408.31	05/20/2005	13:08:01	9.0	10.7	5.0		4.0		5.7	1.7	sand to clay
419	720397.51	251418.16	05/20/2005	13:09:32	11.0	13.0	5.0		6.0		8.0	2.0	sand to clay
420	720379.81	251450.36	05/20/2005	13:11:02	8.8	10.0	5.0		3.8		5.0	1.2	sand to clay
421	720347.34	251477.36	05/20/2005	13:12:13	11.0	13.2	4.9		6.1		8.3	2.2	sand to clay
422	720288.57	251539.44	05/20/2005	13:14:42	10.7	11.5	4.8		5.9		6.7	0.8	sand to clay
423	720232.91	251594.18	05/20/2005	13:16:31	12.0	14.0	4.8		7.2		9.2	2.0	sand to clay
424	720168.68	251659.05	05/20/2005	13:18:40	11.3	14.2	4.7		6.6		9.5	2.9	sand to mud
425	720116.03	251711.56	05/20/2005	13:20:16	10.8	15.2	4.7		6.1		10.5	4.4	mud
426	720063.95	251758.97	05/20/2005	13:22:27	12.4	16.5	4.6		7.8		11.9	4.1	mud
427	720070.06	251757.36	05/20/2005	13:23:15	11.7	16.3	4.6		7.1		11.7	4.6	mud
428	720105.82	251723.57	05/20/2005	13:24:44	9.9	14.5	4.5		5.4		10.0	4.6	mud
429	722021.14	250063.80	05/20/2005	13:32:24	9.7	13.7	4.4		5.3		9.3	4.0	sand to hard pan
430	721890.36	250086.94	05/20/2005	13:34:25	9.3	12.0	4.4		4.9		7.6	2.7	mud to hard pan
431	721817.95	250095.77	05/20/2005	13:36:09	9.2	12.3	4.3		4.9		8.0	3.1	sand
432	721709.54	250106.60	05/20/2005	13:37:40	9.3	14.0	4.3		5.0		9.7	4.7	sand
433	721686.50	250117.04	05/20/2005	13:38:58	8.7	14.8	4.3		4.4		10.5	6.1	mud to sand
434	721626.35	250126.03	05/20/2005	13:40:20	8.5	14.5	4.2		4.3		10.3	6.0	mud to sand
435	721563.89	250136.72	05/20/2005	13:41:37	9.2	14.8	4.2		5.0		10.6	5.6	mud to sand
436	721472.08	250153.64	05/20/2005	13:43:12	9.7	13.7	4.1		5.6		9.6	4.0	mud to sand
437	721380.71	250202.60	05/20/2005	13:44:48	9.6	14.0	4.1		5.5		9.9	4.4	mud to sand to hard pan

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
438	721290.65	250259.30	05/20/2005	13:46:42	9.2	14.8	4.1		5.1		10.7	5.6	sand to mud
439	715857.80	254406.56	05/27/2005	10:42:11	9.7	9.9	2.9		6.8		7.0	0.2	gravel to rock
440	715659.33	254444.93	05/27/2005	10:45:11	8.0	11.9	2.9		5.1		9.0	3.9	sand to hard pan
441	715671.00	254472.31	05/27/2005	10:47:31	8.5	8.9	2.9		5.6		6.0	0.4	gravel to rock
442	715688.22	254483.16	05/27/2005	10:48:48	8.9	9.4	2.9		6.0		6.5	0.5	sand to rock
443	715661.67	254491.15	05/27/2005	10:50:16	9.8	10.9	2.9		6.9		8.0	1.1	mud/sand to rock
444	715605.60	254505.16	05/27/2005	10:52:47	9.8	10.5	2.9		6.9		7.6	0.7	mud to rock
445	715582.43	254455.33	05/27/2005	10:55:02	7.5	10.9	2.9		4.6		8.0	3.4	sand to hard pan
446	715317.67	254445.50	05/27/2005	10:58:47	9.1	11.7	2.9		6.2		8.8	2.6	sand to rock
447	715305.04	254481.28	05/27/2005	11:01:05	7.8	10.8	2.9		4.9		7.9	3.0	sand to hard pan
448	715268.48	254473.48	05/27/2005	11:02:59	7.5	10.5	2.9		4.6		7.6	3.0	mud to hard pan
449	715198.73	254461.29	05/27/2005	11:05:07	7.8	11.7	2.9		4.9		8.8	3.9	sand to hard pan
450	715087.33	254389.16	05/27/2005	11:08:41	7.4	8.9	2.9		4.5		6.0	1.5	mud to hard pan
451	715022.21	254387.88	05/27/2005	11:11:39	9.5	9.9	2.9		6.6		7.0	0.4	gravel to rock
452	714965.59	254384.71	05/27/2005	11:15:02	11.8	12.9	2.9		8.9		10.0	1.1	mud to hard pan
453	714784.76	254424.20	05/27/2005	11:17:51	8.8	9.5	2.9		5.9		6.6	0.7	gravel to rock
454	714777.13	254435.28	05/27/2005	11:19:57	7.0	7.0	2.9		4.1		4.1	0.0	rock
455	714759.75	254436.07	05/27/2005	11:21:20	8.3	8.4	2.9		5.4		5.5	0.1	sand to rock
456	714730.38	254452.60	05/27/2005	11:22:42	6.3	12.2	2.9		3.4		9.3	5.9	sand
457	714691.62	254454.46	05/27/2005	11:24:17	6.8	11.2	2.9		3.9		8.3	4.4	sand to rock
458	714586.47	254507.82	05/27/2005	11:26:08	8.3	13.0	2.9		5.4		10.1	4.7	sand
459	714589.32	254535.61	05/27/2005	11:28:34	6.7	12.7	2.9		3.8		9.8	6.0	sand to mud
460	714641.89	254494.20	05/27/2005	11:30:53	6.2	13.0	2.9		3.3		10.1	6.8	sand
461	714558.72	254538.40	05/27/2005	11:33:50	8.2	13.1	2.9		5.3		10.2	4.9	sand
462	714546.60	254566.36	05/27/2005	11:36:26	8.4	12.2	2.9		5.5		9.3	3.8	sand to hard pan
463	716992.91	253619.51	05/27/2005	11:45:39	7.8	10.0	3.0		4.8		7.0	2.2	sand to hard pan
464	716946.53	253657.67	05/27/2005	11:48:01	7.3	9.0	3.0		4.3		6.0	1.7	sand to hard pan
465	716911.19	253682.40	05/27/2005	11:49:29	6.5	9.5	3.0		3.5		6.5	3.0	sand to hard pan
466	716862.67	253728.10	05/27/2005	11:51:24	7.0	9.5	3.1		3.9		6.4	2.5	sand to hard pan
467	716949.98	253667.66	05/27/2005	11:53:59	9.0	12.7	3.1		5.9		9.6	3.7	mud to hard pan
468	716942.71	253685.52	05/27/2005	11:55:36	9.3	11.0	3.1		6.2		7.9	1.7	sand to hard pan
469	716911.47	253702.07	05/27/2005	11:57:15	9.8	11.8	3.1		6.7		8.7	2.0	mud to hard pan
470	716810.92	253779.04	05/27/2005	11:59:28	6.8	10.1	3.1		3.7		7.0	3.3	sand to hard pan
471	716773.79	253812.71	05/27/2005	12:01:34	6.9	8.8	3.2		3.7		5.6	1.9	gravel to hard pan
472	716724.66	253863.68	05/27/2005	12:59:28	9.3	12.0	4.5		4.8		7.5	2.7	mdu to rock
473	717093.55	253609.07	05/27/2005	13:02:34	11.0	11.4	4.6		6.4		6.8	0.4	gravel to rock
474	717218.56	253482.19	05/27/2005	13:06:14	11.7	12.7	4.7		7.0		8.0	1.0	sand to hard pan
475	717672.63	253294.43	05/27/2005	13:10:16	12.9	13.2	4.8		8.1		8.4	0.3	gravel to rock
476	717649.91	253303.39	05/27/2005	13:11:31	13.4	13.4	4.9		8.5		8.5	0.0	rock
477	717632.09	253315.81	05/27/2005	13:12:18	12.8	12.8	4.9		7.9		7.9	0.0	rock
478	717620.25	253315.08	05/27/2005	13:13:04	13.1	13.3	4.9		8.2		8.4	0.2	gravel to rock
479	717608.47	253321.08	05/27/2005	13:13:50	12.8	14.0	4.9		7.9		9.1	1.2	sand to hard pan
480	717579.22	253335.21	05/27/2005	13:15:35	13.2	16.2	5.0		8.2		11.2	3.0	gravel to mud
481	717547.11	253347.74	05/27/2005	13:16:59	14.8	16.8	5.0		9.8		11.8	2.0	sand to rock
482	717499.95	253369.69	05/27/2005	13:18:41	14.6	15.3	5.1		9.5		10.2	0.7	mud to rock
483	717492.29	253362.97	05/27/2005	13:20:14	11.2	11.8	5.1		6.1		6.7	0.6	sand to rock
484	717488.01	253380.00	05/27/2005	13:21:11	11.8	12.5	5.2		6.6		7.3	0.7	gravel to rock
485	717489.63	253383.64	05/27/2005	13:22:12	12.8	12.9	5.2		7.6		7.7	0.1	gravel to rock
486	717469.21	253394.57	05/27/2005	13:22:59	12.2	13.5	5.2		7.0		8.3	1.3	gravel to rock
487	717477.00	253407.49	05/27/2005	13:24:30	11.2	11.3	5.2		6.0		6.1	0.1	gravel to rock
488	717461.62	253404.83	05/27/2005	13:25:28	12.1	12.7	5.2		6.9		7.5	0.6	gravel to rock
489	717447.53	253416.37	05/27/2005	13:27:07	11.9	12.6	5.3		6.6		7.3	0.7	gravel to rock
490	717416.04	253422.29	05/27/2005	13:28:16	11.3	11.3	5.4		5.9		5.9	0.0	rock
491	717405.89	253422.41	05/27/2005	13:30:11	11.2	12.0	5.4		5.8		6.6	0.8	gravel to rock
492	717401.39	253437.26	05/27/2005	13:31:32	12.5	12.8	5.4		7.1		7.4	0.3	gravel to rock

COACHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
493	717375.96	253421.82	05/27/2005	13:34:17	12.3	12.3	5.5		6.8		6.8	0.0	rock
494	717352.18	253417.57	05/27/2005	13:35:01	13.6	13.6	5.5		8.1		8.1	0.0	rock
495	717728.53	253273.45	05/27/2005	13:39:55	15.5	15.5	5.7		9.8		9.8	0.0	rock
496	717690.57	253280.04	05/27/2005	13:42:35	11.9	11.9	5.8		6.1		6.1	0.0	rock
497	717693.08	253276.62	05/27/2005	13:44:12	12.1	12.1	5.8		6.3		6.3	0.0	rock
498	717790.99	253237.27	05/27/2005	13:46:52	11.4	11.9	5.9		5.5		6.0	0.5	gravel to rock
499	717803.53	253238.35	05/27/2005	13:47:56	13.3	14.2	5.9		7.4		8.3	0.9	gravel to rock
500	717778.37	253257.87	05/27/2005	13:49:31	15.2	16.0	5.9		9.3		10.1	0.8	gravel to rock
501	717789.08	253251.61	05/27/2005	13:51:14	14.9	14.9	6.0		8.9		8.9	0.0	rock
502	717770.36	253245.76	05/27/2005	13:52:15	11.3	11.3	6.0		5.3		5.3	0.0	rock
503	717762.86	253255.93	05/27/2005	13:53:22	13.2	13.2	6.0		7.2		7.2	0.0	rock
504	717851.17	253266.41	05/27/2005	13:55:20	13.3	13.4	6.1		7.2		7.3	0.1	gravel to rock
505	717828.85	253280.97	05/27/2005	13:56:22	13.8	13.8	6.1		7.7		7.7	0.0	rock
506	717908.17	253239.34	05/27/2005	13:57:51	13.2	13.2	6.1		7.1		7.1	0.0	rock
507	717898.35	253246.14	05/27/2005	13:58:33	13.5	14.0	6.2		7.3		7.8	0.5	gravel to rock
508	717892.27	253207.22	05/27/2005	13:59:55	13.7	13.7	6.2		7.5		7.5	0.0	rock
509	717864.83	253210.26	05/27/2005	14:00:46	13.8	13.8	6.2		7.6		7.6	0.0	rock
510	717837.73	253213.33	05/27/2005	14:01:24	14.2	15.1	6.2		8.0		8.9	0.9	mud to rock
511	717947.53	253185.42	05/27/2005	14:03:58	16.5	17.2	6.3		10.2		10.9	0.7	gravel to rock
512	717960.09	253193.68	05/27/2005	14:05:33	17.7	17.7	6.4		11.3		11.3	0.0	rock
513	717976.28	253203.66	05/27/2005	14:06:34	12.8	12.8	6.4		6.4		6.4	0.0	rock
514	717962.95	253213.16	05/27/2005	14:07:09	13.7	13.7	6.4		7.3		7.3	0.0	rock
515	717914.15	253247.85	05/27/2005	14:08:33	10.5	10.5	6.4		4.1		4.1	0.0	rock
516	717897.06	253256.70	05/27/2005	14:09:37	11.2	11.2	6.5		4.7		4.7	0.0	rock
517	717878.81	253267.20	05/27/2005	14:11:14	8.8	8.8	6.5		2.3		2.3	0.0	rock
518	718007.54	253185.88	05/27/2005	14:12:45	14.2	14.2	6.6		7.6		7.6	0.0	rock
519	718034.73	253165.17	05/27/2005	14:13:30	13.7	13.7	6.6		7.1		7.1	0.0	rock
520	718062.52	253153.96	05/27/2005	14:14:41	14.2	14.2	6.6		7.6		7.6	0.0	rock
521	718059.27	253162.97	05/27/2005	14:15:38	12.1	12.1	6.6		5.5		5.5	0.0	rock
522	718072.75	253155.50	05/27/2005	14:16:36	13.7	13.9	6.6		7.1		7.3	0.2	gravel to rock
523	718115.98	253124.82	05/27/2005	14:18:01	13.7	13.7	6.7		7.0		7.0	0.0	rock
524	718096.37	253141.91	05/27/2005	14:18:43	13.1	13.1	6.7		6.4		6.4	0.0	rock
525	718101.75	253128.01	05/27/2005	14:20:25	14.7	14.7	6.7		8.0		8.0	0.0	rock
526	718105.64	253110.28	05/27/2005	14:22:14	13.4	13.4	6.7		6.7		6.7	0.0	rock
527	718085.38	253094.97	05/27/2005	14:23:41	15.8	16.7	6.8		9.0		9.9	0.9	gravel to rock
528	718082.32	253087.37	05/27/2005	14:25:42	16.7	16.7	6.8		9.9		9.9	0.0	rock
529	718016.58	253144.76	05/27/2005	14:27:15	16.9	16.9	6.9		10.0		10.0	0.0	rock
530	717990.72	253157.51	05/27/2005	14:27:59	14.8	14.8	6.9		7.9		7.9	0.0	rock
531	718045.24	253129.96	05/27/2005	14:30:06	16.3	16.3	6.9		9.4		9.4	0.0	rock
532	714371.72	254740.96	05/27/2005	14:55:27	13.2	16.5	7.5		5.7		9.0	3.3	sand
533	714384.38	254746.38	05/27/2005	14:56:59	14.6	17.7	7.5		7.1		10.2	3.1	sand
534	714401.42	254776.93	05/27/2005	14:57:55	13.8	14.5	7.5		6.3		7.0	0.7	gravel to rock
535	714389.92	254791.45	05/27/2005	14:58:41	15.2	15.8	7.5		7.7		8.3	0.6	gravel to rock
536	714370.86	254810.67	05/27/2005	15:00:20	15.7	15.7	7.6		8.1		8.1	0.0	rock
537	714353.16	254825.67	05/27/2005	15:01:17	16.5	17.5	7.6		8.9		9.9	1.0	gravel to hard pan
538	714353.64	254845.92	05/27/2005	15:02:23	12.5	12.5	7.6		4.9		4.9	0.0	rock
539	714372.88	254836.04	05/27/2005	15:04:00	10.5	10.5	7.6		2.9		2.9	0.0	rock
540	714344.00	254862.66	05/27/2005	15:05:33	15.2	15.2	7.6		7.6		7.6	0.0	rock
541	714347.31	254875.49	05/27/2005	15:06:19	15.1	15.3	7.7		7.4		7.6	0.2	gravel to rock
542	714282.27	254913.06	05/27/2005	15:07:13	14.7	15.7	7.7		7.0		8.0	1.0	sand to hard pan
543	714275.49	254900.03	05/27/2005	15:08:48	13.3	15.0	7.7		5.6		7.3	1.7	sand to hard pan
544	714259.72	254927.67	05/27/2005	15:10:29	14.2	15.7	7.7		6.5		8.0	1.5	sand to rock
545	714142.54	255016.22	05/27/2005	15:11:36	15.2	15.2	7.7		7.5		7.5	0.0	rock
546	714099.98	255023.37	05/27/2005	15:13:36	14.3	14.6	7.8		6.5		6.8	0.3	sand to rock
547	713669.96	255002.22	05/27/2005	15:17:11	15.3	15.5	7.8		7.5		7.7	0.2	gravel to rock

COCHECO RIVER ROCK PROBES

NO	NORTHING	EASTING	DATE	TIME	SDG	PRB	TID	R	SDG	R	PRB	PEN	DESC
548	713633.88	254994.67	05/27/2005	15:18:43	14.0	14.0	7.8		6.2		6.2	0.0	rock
549	713621.59	255026.22	05/27/2005	15:19:55	15.9	15.9	7.9		8.0		8.0	0.0	rock
550	713597.46	255022.03	05/27/2005	15:20:48	15.7	15.7	7.9		7.8		7.8	0.0	rock
551	713586.33	255013.84	05/27/2005	15:22:27	15.0	15.0	7.9		7.1		7.1	0.0	rock
552	713566.01	254988.58	05/27/2005	15:23:56	11.2	11.2	7.9		3.3		3.3	0.0	rock
553	713552.80	255004.30	05/27/2005	15:25:08	15.3	15.3	7.9		7.4		7.4	0.0	rock
554	713572.00	255010.49	05/27/2005	15:26:00	15.5	15.5	7.9		7.6		7.6	0.0	rock
555	713573.63	255025.05	05/27/2005	15:26:47	15.4	16.2	8.0		7.4		8.2	0.8	gravel to rock
556	713513.44	254984.73	05/27/2005	15:28:51	11.7	11.7	8.0		3.7		3.7	0.0	rock
557	713531.00	255013.48	05/27/2005	15:30:01	15.2	15.5	8.0		7.2		7.5	0.3	gravel to rock
558	713536.67	255022.41	05/27/2005	15:31:00	15.3	15.3	8.0		7.3		7.3	0.0	rock
559	713500.01	255014.01	05/27/2005	15:31:50	15.2	15.5	8.0		7.2		7.5	0.3	gravel to rock
560	713502.11	255030.10	05/27/2005	15:32:56	14.8	15.5	8.0		6.8		7.5	0.7	gravel to rock
561	713471.63	255004.57	05/27/2005	15:35:15	14.8	14.8	8.1		6.7		6.7	0.0	rock
562	713445.88	255039.18	05/27/2005	15:36:27	15.0	15.3	8.1		6.9		7.2	0.3	gravel to rock
563	713416.68	255014.20	05/27/2005	15:37:57	16.3	16.3	8.1		8.2		8.2	0.0	rock
564	713395.49	255008.84	05/27/2005	15:38:58	15.0	15.0	8.1		6.9		6.9	0.0	rock
565	713401.55	255039.83	05/27/2005	15:40:10	16.5	17.5	8.2		8.3		9.3	1.0	sand to hard pan
566	713417.38	255043.95	05/27/2005	15:43:55	16.1	16.5	8.2		7.9		8.3	0.4	gravel to rock
567	713376.27	255022.19	05/27/2005	15:45:19	15.9	16.2	8.2		7.7		8.0	0.3	sand to rock

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SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

The general description below is given to indicate the approximate scope of this project only. It does not limit the work required under the project drawings and specifications.

The work of this project consists of maintenance dredging of the three mile long and seven foot deep Federal Navigation Channel and adjacent areas of the Cocheco River in Dover, New Hampshire. Dredging in the Federal Channel shall be performed from the confluence of the Cocheco River and Piscataqua River to the head of navigation in the Cocheco River. Dredged materials will include primarily silt and sands with cobbles and boulders. Some ledge removal is required. Disposal of the dredged materials shall be in an upland lined disposal area owned and operated by the City of Dover, New Hampshire. The land haul distance from the off-load location to the disposal facility is approximately 1/4 mile. The Contractor is responsible for developing the scow off-load site which is just beyond the upstream limit of the navigation channel.

Material to be dredged is known to be contaminated with PAH's, TPH, and the metals chromium, lead, mercury, and antimony. The Contractor shall use a closed bucket mechanical dredge and shall not allow overflow of dredge water from scows into the river. Dredge water shall be pumped from the scows at the off-load location into tank trucks, hauled to the disposal area, and pumped out of the trucks into the disposal area without spillage.

Dredge material shall be removed from the scows at the off-load location, hauled to the disposal area in leak-proof dump trucks, and off-loaded into the disposal area without spillage.

The dredging work of this project shall be performed during the 15 November 2005 through 15 March 2006 timeframe. The Contractor shall expect the potential for sub-freezing temperatures, adverse weather conditions throughout the performance period, and ice formations on the river in areas to be dredged.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Progress Schedule; G, RO.

In accordance with the contract clauses, the Contractor shall, within five (5) days after receipt of notice to proceed or as otherwise determined by the Contracting Officer, submit for

approval a practicable progress schedule. When changes are authorized that result in contract time extensions, Contractor shall submit a modified chart for approval by the Contracting Officer.

SD-02 Shop Drawings

Record Drawings; G, DO.

Record drawings showing all deviations which have been made from the contract drawings shall be submitted to the Contracting Officer for approval at the completion of work. See paragraph RECORD DRAWINGS for record keeping and submittal requirements.

1.3 PROJECT/SITE CONDITIONS

1.3.1 Physical Data

See the Contract Clause entitled PHYSICAL DATA as well as the following information. Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. Site Conditions: The indications of physical conditions on the contract drawings and in the specifications are the result of site investigations and surveys. The conditions represented prevailed at the time the investigations and surveys were made. A pre-dredge survey may be performed by the Government prior to the start of Contractor dredging operations at the site. Before commencing work at the site, the Contractor shall verify the existing conditions indicated on the drawings and in the specifications. See CONTRACT CLAUSE entitled "SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK."

b. Weather Conditions: The monthly normal mean temperature and the monthly normal mean precipitation for the site may be obtained by the Contractor from the nearest U.S. National Weather Service Office.

c. Tide Conditions: The mean range of tide for the Federal Navigation Channel in the Cocheco River is 7.03 feet MLW to MHW and the spring range is 7.67 feet MLLW to MHHW feet. The site of the work is well protected from wind and wave attack.

d. Conditions of Channel: The channel was last maintained by the Federal Government in 1905. Soundings shown on the contract drawings are the results of surveys conducted during April 2003 and are believed to indicate existing conditions.

e. Channel Traffic: The Federal Navigation Channel in the Cocheco River is mainly used by small recreation and commercial craft during the warm weather months. The dredging will occur during the winter months, so interference with channel traffic will be minimal. The Government will not undertake to keep the channel free from vessels or other obstructions, except to the extent of applicable regulations. The Contractor will be required to conduct the work in such a manner as to obstruct navigation as little as possible, and in the event the Contractor's plant so obstructs the channel as to make difficult or endanger the passage of any vessels, the plant shall be promptly moved on the approach of any vessel to such an extent as may be necessary to

afford a practicable passage.

1.3.2 Coordination with Other Work

The Contractor for this work shall coordinate his construction activities with the Contractor operating the dredged material disposal area. In case of dispute regarding work operations or the use of work areas, resolution will be by the Contracting Officer and his decision shall be final. No direct or extra compensation will be allowed on account of the coordination or cooperation required (see CONTRACT CLAUSE entitled "OTHER CONTRACTS").

1.4 SEQUENCING AND SCHEDULING

1.4.1 Hours of Operations

The Contractor will be allowed to perform work 24 hours per day, seven days per week, including holidays, for the entire performance period.

1.4.2 Work Sequence

1.4.2.1 General

There are certain essential criteria relative to the preparation of a work sequence and time schedule which the Contractor will be required to implement and follow during the prosecution of the work. See Section 02325 DREDGING for the required order of work. Minor variations in the sequence of the items of work as approved may be made by the Contractor, provided such variations do not conflict with critical elements of the schedule. Proposed minor variations shall be noted on the progress charts submittal required by CONTRACT CLAUSE entitled "SCHEDULES FOR CONSTRUCTION CONTRACTS." Variations shall be approved by the Contracting Officer prior to implementation.

1.4.2.2 Progress Schedule

The progress schedule shall be in the form of a chart graphically indicating the sequence proposed to accomplish each work feature or operation. The chart shall be prepared to show the starting and completion dates of all work features on a linear horizontal time scale beginning with date of Notice to Proceed and indicating calendar days to completion. Contractor shall indicate on the chart the important work features or operations that are critical to the timely overall completion of the project. Key dates for such important work features and portions of work features are milestone dates and shall be so indicated on the chart. This schedule will be the medium through which the timeliness of the Contractor's construction effort is appraised. Anticipated adverse weather delay days shall be included in the schedule.

1.4.3 Organization at the Site

1.4.3.1 General

The Contractor shall employ ample personnel and sufficient equipment to accomplish the work of this contract in the least amount of time, within the prosecution period specified in SPECIAL CONTRACT REQUIREMENTS, Paragraph 1.

1.4.3.2 Rate of Progress

Should the Contractor fail to maintain a satisfactory rate of progress, the Contracting Officer may require that additional personnel and equipment be placed on the work and weekend and overtime work be performed, in order that the work be brought up to schedule and maintained.

1.5 CONTRACTOR USE OF PREMISES

1.5.1 Work Limits

The limits of work consist of the shoaled areas of the channel as shown on the contract drawings and the side slope areas which must be dredged to obtain the required depth.

1.5.2 Contractor's Receipt of Supplies

The Contractor shall be responsible for all arrangements for the receipt of materials and supplies at the job site. Government personnel are not permitted to receive or sign for items delivered to the site.

1.5.3 Access to Work Site

Access to the project site is currently available for construction traffic.

1.6 COORDINATION

1.6.1 Public Notice

The public shall be notified of this dredging project approximately two weeks before commencement of dredging operations at the site, for each dredging season. A brief description of the work to be performed and the intended schedule of dredging and disposal operations shall be published in a newspaper of general circulation in the area adjacent to the dredging. The notice shall include the locations where the work is to be performed, the time sequence of events, and the location and limits of the disposal site. The notice shall include the Contractor's point of contact and telephone number.

1.6.2 Notice to Mariners

Before beginning dredging operations, the Contractor shall coordinate with the U.S. Coast Guard (USCG) to issue a "Notice to Mariners" regarding the work to be performed and the Contractor's proposed operations.

The U.S. Army Corps of Engineers and the USCG have agreed to phraseology when issuing navigational bulletins and notices. The information furnished shall be consistent with "USCG Broadcast Notice to Mariners" and "Local Notice to Mariners". When requesting local USCG offices to issue navigational information for U.S. Army Corps of Engineers work involving marine construction, the following terminology shall be used, as applicable:

For cautionary areas: "Mariners are urged to use extreme caution in the area."

For dredging and work operations: "Mariners are urged to transit at their slowest safe speed to minimize wake and proceed with caution after passing arrangements have been made."

1.6.3 Moorings

The City of Dover will be responsible for the removal and replacement of moorings at no cost to the Contractor. The Contractor shall coordinate the time schedule necessary for the removal of moorings with the harbor master.

1.6.4 Points-of-Contact

a. Coast Guard: Mr. John Mauro, 617-223-8355.

b. City of Dover: Dean Peschel, 288 Central Avenue, Dover, New Hampshire 03820-4169, Telephone 603-516-6094.

Additional Points-of-Contact for utility owners are listed in Section 02325 DREDGING

1.7 PRECONSTRUCTION CONFERENCE

The Contracting Officer will conduct a preconstruction conference with key Contractor personnel. The purpose of the conference is to review contract requirements and to establish a working relationship between the Contractor's Staff and the Corps of Engineers personnel who will be closely associated with the project. During the conference, the Contracting Officer will inform the Contractor concerning Job Safety, Quality Control, Labor Relations, and Environmental Protection. The Contractor's Superintendent and Quality Control Representative shall attend this conference. All submittals which are ready for submission prior to the start of the work may be brought to the conference for distribution to the participating reviewers.

1.8 RECORD DRAWINGS

Maintain at the jobsite one set of full-size contract drawings marked to show any deviations which have been made from the contract drawings, including buried or concealed construction and utility features revealed during the course of construction. Record the horizontal and vertical location of all buried utilities that differ from the contract drawings. These drawings shall be available for review by the Contracting Officer at all times. Upon completion of the work, submit the original marked set of prints to the Contracting Officer for approval. Requests for partial payments will not be approved if the marked prints are not current, and request for final payment will not be approved until the marked prints are submitted to and approved by the Contracting Officer.

1.8.1 Preparation of Record Drawings

The entries shall be made in the jobsite set of prints at the time field changes are made, pertinent information collected, or need for corrections established, as a continuing process during the life of the contract. As revised drawings are issued by the Contracting Officer, revised prints shall be introduced into the set to replace the superseded drawings and all applicable notations previously made on the superseded drawings transferred to the current prints. Carefully prepared sketches, not less than 8-1/2" x 11", may be used to depict changes or added information in lieu of notations on the actual prints. Staple sketches to the prints affected by the change. All plan views, sections, elevations, profiles, diagrams, details, or schedules affected by a change shall be marked up as required to reflect the change. All notations or changes made on the prints shall be in sufficient detail to clearly depict the change. Colored pens or

pencils shall be used to make notations on the as-built prints as follows:

Red pen or pencil shall be employed to indicate added or corrected work or information.

Green pen or pencil shall be used to show the deleted or incorrectly depicted work or information.

Blue or black pen or pencil shall be used to show information not to be recorded on the drawings but included on the marked-up prints for explanatory or clarification purposes for the benefit of the Contracting Officer.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

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SECTION 01270

MEASUREMENT AND PAYMENT

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PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section Table of Contents --

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 REFERENCES (Not Applicable)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-05 Design Data

Quantity Surveys

Submit originals of all field notes and all other records relating to the quantity surveys.

1.3 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.4 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items. Submit originals of all field notes and all other records relating to Quantity Surveys.

1.5 BIDDING SCHEDULE - PAYMENT ITEMS

Payment items for the work of this contract on which the contract progress payments will be based are listed in the BIDDING SCHEDULE and are described below. All costs for items of work, which are not specifically mentioned to be included in a particular Bidding Schedule lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved.

a. Item No. 0001, "Mobilization and Demobilization for Dredging

Operations".

All costs for labor, equipment, and materials for mobilization and demobilization for dredging operations, as defined in the Special Contract Requirements Clause "PAYMENT FOR MOBILIZATION AND DEMOBILIZATION". Separate payment will be made for the mobilization and demobilization of equipment and materials for performing drilling and blasting operations, as specified in Item No. 0002.

Unit of measure: Lump Sum (LS).

b. Item No. 0002, "Mobilization and Demobilization for Rock Removal Operations".

All costs for labor, equipment, and materials for mobilization and demobilization for rock removal operations, as defined in the Special Contract Requirements Clause "PAYMENT FOR MOBILIZATION AND DEMOBILIZATION". Separate payment will be made for the mobilization and demobilization of equipment and materials for performing dredging operations, as specified in Item No. 0001.

Unit of measure: Lump Sum (LS).

c. Item Nos. 0003A and 0003B, "Dredging and Disposal, Mechanical; Material from Federal Channel".

The contract price per cubic yard for Item No. 0003 "Dredging and Disposal, Mechanical; Material from Federal Channel", shall include all cost of removal and disposal of all materials, except for rock excavation as defined below, from the Cocheco River Federal Navigation Channel, as shown on the contract drawings and as specified in Section 02325 DREDGING and other appropriate sections of the specifications.

The total amount of material removed and paid for under the contract for this Item, will be measured by the cubic yard in place by computing the volume between the bottom surface shown by soundings of the last pre-dredge survey made immediately before dredging of the soft material and the hard material surface shown by the soundings of a post-dredge survey made as soon as practicable after the removal of the soft material, including that within the limits of the side slopes and specified channel overdepth as described in Section 02325 DREDGING, paragraph OVERDEPTH AND SIDE SLOPES, less any deductions that may be required for misplaced material described in paragraph DISPOSAL OF EXCAVATED MATERIAL.

The contract price per cubic yard for dredging for this item shall include the cost of removal and disposal of all materials as specified herein or indicated on the contract drawings, except ledge rock, large boulders, and other unclassified materials, which cannot be removed by the plant specified in the accepted bid, or the equivalent of such plant, without blasting or hoe ram percussive methods. Should ledge rock or other material which cannot be removed by the plant specified in the accepted bid, or its equivalent, without blasting or hoe ram percussive methods, be encountered, the Contractor shall remove therefrom all overlying material which in the judgement of the Contracting Officer can be removed by the use of plant so specified or its equivalent.

The contract drawings listed in the Special Contract Requirements,

Paragraph "Contract Drawings, Maps and Specifications" are believed to accurately represent conditions existing on the date of the last survey shown on the drawings, but the depths and the specific areas to be dredged shown thereon will be verified and corrected by soundings taken by the Government immediately before dredging. Determination of quantities removed and the deductions made to determine quantities after having once been made by the Contracting Officer, will not be reopened, except on evidence of collusion, fraud, or obvious error.

Monthly partial payments will be based on approximate quantities determined by Contractor quality control surveys. The pre-dredge survey made immediately before dredging of the soft material and the post-dredge survey made as soon as practicable after the removal of the soft material will be performed by the Government at no cost to the Contractor.

Unit of measure: Cubic Yard (CD).

d. Item Nos. 0004A and 0004B, "Rock Removal".

The contract price per cubic yard for rock excavation from the Federal Channel shall include the cost of removal and disposal of all ledge rock, large boulders, and other unclassified materials, which cannot be removed without systematic drilling and blasting or hoe ram percussive methods. Prior to rock excavation, the Contractor shall remove all of the overlying material, which in the judgement of the Contracting Officer can be removed by the use of the Contractor's plant. Rock material shall then be removed in accordance with Section 02328 UNDERWATER DRILLING AND BLASTING or by hoe ram percussive methods. The total amount of rock material removed and paid for under the contract, will be measured by the cubic yard in place by computing the volume between the bottom surface, created after removal of the overlying material, as shown by soundings of the post-dredge survey made after removing the overlying material and the bottom surface shown by the soundings of a post-dredge survey made as soon as practicable after dredging the rock material, including that within the limits of the overdepth and side slopes described in Section 02325 DREDGING, paragraph OVERDEPTH AND SIDE SLOPES, less any deductions that may be required for misplaced material described in paragraph DISPOSAL OF EXCAVATED MATERIAL. Disposal includes transportation of the material to the disposal site.

Determination of quantities of rock material removed under this item and the deductions made to determine quantities after having once been made by the Contracting Officer, will not be reopened, except on evidence of collusion, fraud, or obvious error.

Monthly partial payments will be based on approximate quantities determined by Contractor quality control surveys. The pre-dredge survey made immediately before drilling and blasting and removal of the rock material and the post-dredge survey made as soon as practicable after the removal of the rock material will be performed by the Government at no cost to the Contractor.

Unit of measure: Cubic Yard (CD).

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

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SECTION 01330

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PART 2 MATERIALS (Not Used)

PART 3 PROCEDURES (Not Used)

-- End of Section Table of Contents --

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals".

1.1.2 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by SD numbers and titles as follows.

SD-01 Preconstruction Submittals

- Certificates of insurance.
- Surety bonds.
- List of proposed subcontractors.
- List of proposed products.
- Construction Progress Schedule.
- Submittal register.
- Schedule of prices.
- Health and safety plan.
- Work plan.
- Quality control plan.
- Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

1.1.3 Approving Authority

Office authorized to approve submittal.

1.1.4 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal register; G, RO.

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings".

1.3.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.4 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be

considered unless accompanied by an explanation of why a substitution is necessary.

1.5 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.6 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.7 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8 SUBMITTAL REGISTER

At the end of this section is a submittal register showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall track all submittals.

1.9 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 21 calendar days

exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

1.10 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are included in the QCS software that the Contractor is required to use for this contract. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.11 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.11.1 Procedures

Submit seven (7) copies of each submittal item with an attached ENG FORM 4025 Transmittal Form.

a. Construction/Operations Division {"AO" (Area Office), "RO" (Resident Office), or "PO" (Project Office) Reviewer}: An "AO", "RO", or "PO" in column "f" indicates that the submittal review action is by New England District Construction/Operations Division. Send all such submittals to the project Resident or Area Engineer, as applicable.

b. Engineering/Planning Division {"DO" (District Office) Reviewer}: A "DO" on the attached submittal register, column "f" indicates that the submittal review action is by the New England District, Engineering/Planning Division, or other organization in the District Office. Send all such submittals to the U.S. Army Corps of Engineers, New England District 696 Virginia Road, Concord, Massachusetts 01742-2751.

c. Architect-Engineer Firm {"AE" reviewer}: An "AE" on the attached submittal register, column "f" indicates that the submittal review action is by the Architect-Engineer firm associated with the project.

1.11.2 Information on Submittal Status

All Contractor requests for current status of submittal reviews shall be made through the Resident Engineer.

1.11.3 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.12 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register".

1.13 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Five copies of the submittal will be retained by the Contracting Officer and two copies of the submittal will be returned to the Contractor.

1.14 INFORMATION ONLY SUBMITTALS

Normally, submittals designated as "For Information Only" will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.15 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

<p>CONTRACTOR</p> <p>(Firm Name)</p> <p>_____ Approved</p> <p>_____ Approved with corrections as noted on submittal data and/or attached sheets(s).</p> <p>SIGNATURE: _____</p> <p>TITLE: _____</p> <p>DATE: _____</p>

PART 2 MATERIALS (Not Used)

PART 3 PROCEDURES (Not Used)

-- End of Section --

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)

TO:	FROM:	CONTRACT NO.	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
-----	-------	--------------	--

SPECIFICATION SEC. NO. (Cover only one section with each transmittal)	PROJECT TITLE AND LOCATION	CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL

[illegible]

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by Item No.)	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- | | | | |
|------|--|-------|---|
| A -- | Approved as submitted. | E -- | Disapproved (See attached). |
| B -- | Approved, except as noted on drawings. | F -- | Receipt acknowledged. |
| C -- | Approved, except as noted on drawings.
Refer to attached sheet resubmission required. | FX -- | Receipt acknowledged, does not comply
as noted with contract requirements. |
| D -- | Will be returned by separate correspondence. | G -- | Other (Specify) |
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

TITLE AND LOCATION																		CONTRACTOR																	
MAINTENANCE DREDGING COCHECO RIVER, DOVER, NH																																			
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH#	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS																		
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION	ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION																				
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		01110	SD-01 Preconstruction Submittals																																
			Progress Schedule	1.4.2.2	G RO																														
			SD-02 Shop Drawings																																
			Record Drawings	1.8	G DO																														
		01270	SD-05 Design Data																																
			Quantity Surveys	1.4	FIO																														
		01330	SD-01 Preconstruction Submittals																																
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		01351	SD-02 Shop Drawings																																
			Work Zones	1.17.1	FIO																														
			Decontamination Facilities	1.18.1	FIO																														
			SD-03 Product Data																																
			Exposure Monitoring/Air Sampling Program	1.12	FIO																														
			Site Control Log	1.17.2	FIO																														
			HAZWOPER Qualifications		FIO																														
			Certificates																																
		01355	SD-01 Preconstruction Submittals																																
			Environmental Protection Plan	1.7	G RO																														
		01500	SD-01 Preconstruction Submittals																																
			Site Plan	1.3	G RO																														
		01545	SD-01 Preconstruction Submittals																																
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CONTRACT NO. W912WJ-05-B-0015

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SECTION 01351

SAFETY, HEALTH, AND EMERGENCY RESPONSE (HTRW/UST)

PART 1 GENERAL1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1 (1998) Emergency Eyewash and Shower Equipment

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety and Health Requirements Manual

ER 385-1-92 (2000) Safety and Occupational Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

1.2 DESCRIPTION OF WORK

This section requires contractors to implement practices and procedures for working safely and in compliance with OSHA and USACE regulation while performing cleanup activities on uncontrolled hazardous waste sites.

The Cocheco River Maintenance Dredging Project does not fall under the scope of 29 CFR 1910, Section .120, "Hazardous Waste Operations and Emergency Response". However, due to the presence of high concentrations of several contaminants, including polyaromatic hydrocarbons (PAHs) at 833 mg/kg, chromium, and total petroleum hydrocarbons (TPH), there is a need to ensure those individuals involved in the project, the public, and the environment are protected. The training, practices, and procedures required by 29 CFR 1910, Section .120 will ensure that the objectives are met. The contractor will ensure that requirements of 29 CFR 1910, Section .120

are implemented by all involved in the project.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Work Zones.

Drawings including initial work zone boundaries: Exclusion Zone (EZ), including restricted and regulated areas; Contamination Reduction Zone (CRZ); and Support Zone (SZ).

Decontamination Facilities.

Drawings showing the layout of the personnel and equipment decontamination facilities.

SD-03 Product Data

Exposure Monitoring/Air Sampling Program.

Personnel exposure monitoring/sampling results.

Site Control Log.

Record of each entry and exit into the site, as specified.

HAZWOPER Qualifications Certificates.

A certificate for each worker performing cleanup operations with potential for unacceptable occupational exposure signed by the safety and health manager and the occupational physician indicating the workers meet the training and medical surveillance requirements of this contract.

1.4 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with EM 385-1-1, OSHA requirements in 29 CFR 1910 and 29 CFR 1926, especially OSHA's Hazardous Waste Operations and Emergency Response Standard 29 CFR 1926.65/29 CFR 1910.120 and state specific OSHA requirements where applicable. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 SAFETY AND HEALTH PROGRAM

The Contractor shall develop and implement a Safety and Health Program (SHP) which incorporates requirements in OSHA standards 29 CFR 1910, Section .120 (b) and 29 CFR 1926, Section .65 (b) and section 01.A.07 of EM 385-1-1. The Safety and Health Program shall address the items in

paragraph (b) of 29 CFR 1910.120/29 CFR 1926.65 and Appendix A of EM 385-1-1 in corporate specific detail. These items are: Signature Sheet; Background Information; Statement of Safety and Health Policy; Responsibilities and Lines of Authority; Subcontractors and Suppliers; Training; Safety and Health Inspections; Safety and Health Expectations, Incentives programs and Compliance; Accident Reporting; Medical Surveillance/Medical Support; Personal Protective Equipment; Standard Operating Procedures and Corporate Plans supporting occupational safety and health.

1.6 SITE SAFETY AND HEALTH PLAN

The Contractor shall develop and implement a Site Safety and Health Plan (SSHP) meeting the requirements of section 01.A.10 of EM 385-1-1 and 29 CFR 1910.120/29 CFR 1926.65 (b) (4). At a minimum, the SSHP shall address each element in Appendix C of ER 385-1-92 and shall incorporate an Activity Hazard Analysis for each major phase of the work meeting the requirements of 01.A.10 and Figure 1-1 of EM 385-1-1.

a. The SSHP shall be considered a living document and shall be updated as occupational safety and health conditions change during project execution and improved as occupational safety and health lessons are learned during the course of the project.

b. SSHP elements in Appendix C of ER 385-1-92 are: 1. Site Description and Contamination Characterization; 2. Activity Hazard Analysis; 3. Health and Safety Staff Organization, Qualifications and Responsibilities for the project; 4. Health and Safety Training requirements for the project; 5. Personal Protective Equipment; 6. Medical Surveillance requirements for the project; 7. Exposure Monitoring/Air Sampling; 8. Heat Stress/Cold Stress Prevention; 9. Applicable elements of the Safety and Health Program edited to meet site specific conditions and site specific standard operating safety procedures, engineering controls and work practices used to reduce exposure to contaminants and prevent accidents; 10. Site Control Measures; 11. Personal Hygiene and Decontamination; 12. Equipment Decontamination; 13. Emergency Equipment and First Aid Requirements; 14. Emergency Response and Contingency Procedures. 15. Accident Prevention; 16. Logs, Reports and Recordkeeping.

1.6.1 Acceptance and Modifications

Prior to submittal, the SSHP shall be signed and dated by the Safety and Health Manager and the Site Superintendent. The SSHP shall be submitted for review 10 days prior to the Preconstruction Safety Conference. Deficiencies in the SSHP will be discussed at the preconstruction safety conference, and the SSHP shall be revised to correct the deficiencies and resubmitted for acceptance. Onsite work shall not begin until the plan has been accepted. A copy of the written SSHP shall be maintained onsite. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring such hazard to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of

this specification or the accepted SSHP shall be cause for stopping of work until the matter has been rectified.

1.6.2 Availability

The SSHP shall be made available in accordance with 29 CFR 1910, Section .120 (b) (1) (v) and 29 CFR 1926, Section .65 (b) (1) (v).

1.7 TASK SPECIFIC HAZARDS, INITIAL PPE, HAZWOPER MEDICAL SURVEILLANCE AND TRAINING APPLICABILITY

Task specific occupational hazards, task specific HAZWOPER medical surveillance and training applicability and task specific initial PPE requirements for the project are listed on the **Task Hazard and Control Sheet** at the end of this section. It is the Contractor's responsibility to reevaluate occupational safety and health hazards as the work progresses and to adjust the PPE and onsite operations, if necessary, so that the work is performed safely.

1.8 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

1.8.1 Safety and Health Manager

Safety and Health manager shall be an Industrial Hygienist certified by the American Board of Industrial Hygiene or a safety professional certified by the Board of Certified Safety Professionals.

1. The Safety and Health Manager shall have the following additional qualifications:

a. A minimum of 3 years experience in developing and implementing safety and health programs at hazardous waste sites in the chemical industry.

b. Documented experience in supervising professional and technician level personnel.

c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.

d. Documented experience in the development of personal protective equipment programs, including programs for working in and around potentially toxic, flammable and combustible atmospheres and confined spaces.

e. Working knowledge of state and Federal occupational safety and health regulations.

2. The Safety and Health Manager shall:

a. Be responsible for the development, implementation, oversight, and enforcement of the SSHP.

b. Sign and date the SSHP prior to submittal.

c. Conduct initial site-specific training.

d. Visit the site as needed and at least once per month for the duration of activities, to audit the effectiveness of the SSHP.

- e. Be available for emergencies.
- f. Provide onsite consultation as needed to ensure the SSHP is fully implemented.
- g. Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.
- h. Provide continued support for upgrading/downgrading of the level of personal protection.
- i. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.
- j. Review accident reports and results of daily inspections.
- k. Serve as a member of the Contractor's quality control staff.

1.8.2 Site Safety and Health Officer

An individual shall be designated the Site Safety and Health Officer (SSHO). The name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer shall be included in the SSHP.

1. The SSHO shall have the following qualifications:
 - a. A minimum of 2 years experience in implementing safety and health programs at hazardous waste sites or in the hazardous waste disposal industry where Level C personal protective equipment was required.
 - b. Documented experience in construction and dredging techniques and related safety procedures.
 - c. Working knowledge of Federal and state occupational safety and health regulations.
 - d. Specific training in personal and respiratory protective equipment program implementation, confined space program oversight, and in the proper use of air monitoring instruments, and air sampling methods including monitoring for ionizing radiation.
2. The Site Safety and Health Officer shall:
 - a. Assist and represent the Safety and Health Manager in onsite training and the day to day onsite implementation and enforcement of the accepted SSHP.
 - b. Be assigned to the site on a full time basis for the duration of field activities. The SSHO shall have no duties other than Safety and Health related duties. If operations are performed during more than 1 work shift per day, a site Safety and Health Officer shall be present for each shift.
 - c. Have authority to ensure site compliance with specified safety

and health requirements, Federal, state and OSHA regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

d. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.

e. Consult with and coordinate any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.

f. Serve as a member of the Contractor's quality control staff on matters relating to safety and health.

g. Conduct accident investigations and prepare accident reports.

h. Review results of daily quality control inspections and document safety and health findings into the Daily Safety Inspection Log.

i. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

1.8.3 Occupational Physician

The services of a licensed physician, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board eligible, shall be utilized. The physician shall be familiar with this site's hazards and the scope of this project. The medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities shall be included in the SSHP. The physician shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910, Section .120 (f) and 29 CFR 1926, Section .65 (f) and paragraph MEDICAL SURVEILLANCE.

1.8.4 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but shall be immediately available to render first aid when needed.

1.8.5 Safety and Health Technicians

For each work crew in the exclusion zone, one person, designated as a Safety and Health technician, shall perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They shall have appropriate training equivalent to the SSHO in each

specific area for which they have responsibility and shall report to and be under the supervision of the SSHO.

1.9 TRAINING

The Contractor's training program for workers performing cleanup operations and who will be exposed to contaminants shall meet the following requirements.

1.9.1 General Hazardous Waste Operations Training

All Personnel performing duties with potential for exposure to on-site contaminants, including all personnel working on the dredge, scows, or at the off-load facility, shall meet and maintain the following 29 CFR 1910.120/29 CFR 1926.65 (e) training requirements:

- a. 40 hours of off site hazardous waste instruction.
- b. 3 days actual field experience under the direct supervision of a trained, experienced supervisor.
- c. 8 hours refresher training annually.

Onsite supervisors shall have an additional 8 hours management and supervisor training specified in 29 CFR 1910 .120/29 CFR 1926 .65 (e) (4).

1.9.2 Initial Session (Pre-entry Briefing)

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, shall attend a site-specific safety and health training session of a sufficient duration to review the SSHP, practices and procedures to be utilized, and answer all questions. This session shall be conducted by the Safety and Health Manager and/or the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Procedures and contents of the accepted SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1 shall be thoroughly discussed. The Contracting Officer shall be notified at least 5 days prior to the initial site-specific training session so Government personnel involved in the project may attend.

1.9.3 Periodic Sessions

Periodic onsite training shall be conducted by the SSHO at least daily for personnel assigned to work at the site during the following day. The training shall address safety and health procedures, work practices, any changes in the SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Should an operational change affecting onsite field work be made, a meeting prior to implementation of the change shall be convened to explain safety and health procedures. Site-specific training sessions for new personnel, visitors, and suppliers shall be conducted by the SSHO using the training curriculum outlines developed by the Safety and Health Manager.

1.10 PERSONAL PROTECTIVE EQUIPMENT

1.10.1 Site Specific PPE Program

Onsite personnel exposed to contaminants shall be provided with appropriate

personal protective equipment. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH shall be used. Protective equipment and clothing shall be kept clean and well maintained. The PPE section of the SSHP shall include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

1.10.2 Levels of Protection

The Safety and Health Manager shall establish and evaluate as the work progresses the levels of protection for each work activity. The Safety and Health Manager shall also establish action levels for upgrade or downgrade in levels of PPE. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE evaluation protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.10.3 PPE for Government Personnel

Three clean sets of personal protective equipment and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and/or Contamination Reduction Zone, shall be available for use by the Contracting Officer or official visitors. The items shall be cleaned and maintained by the Contractor, stored, and clearly marked: "FOR USE BY GOVERNMENT ONLY." The Contractor shall provide basic training in the use and limitations of the PPE provided.

1.11 MEDICAL SURVEILLANCE PROGRAM

The Contractor's medical surveillance program for workers performing cleanup operations and who will be exposed to contaminants shall meet 29 CFR 1910.120/1926.65 (f) and the following requirements. The Contractor shall assure the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program shall be without cost to the employee, without loss of pay and at a reasonable time and place.

1.11.1 Frequency of Examinations

Medical surveillance program participants shall receive medical examinations and consultations on the following schedule:

- a. Every 12 months.
- b. If and when the participant develops signs and symptoms indicating a possible overexposure.
- c. Upon termination or reassignment to a job where medical surveillance program participation is not required, unless his/her previous annual examination/consultation was less than 6 months prior to reassignment or termination.
- d. On a schedule specified by the occupational physician.

1.11.2 Content of Examinations

The physical examination/consultation shall verify the following information about medical surveillance program participants:

- a. Baseline health conditions and exposure history.
- b. Allergies/sensitivity/susceptibility to hazardous substances exposure.
- c. Ability to wear personal protective equipment inclusive of NIOSH certified respirators under extreme temperature conditions.
- d. Fitness to perform assigned duties.

The Contractor shall provide the occupational physician with the following information for each medical surveillance program participant:

- a. Information on the employee's anticipated or measured exposure.
- b. A description of any PPE used or to be used.
- c. A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress).
- d. A copy of 29 CFR 1910 Section .120, or 29 CFR 1926 Section .65.
- e. Information from previous examinations not readily available to the examining physician.
- f. A copy of Section 5.0 of NIOSH 85-115.
- g. Information required by 29 CFR 1910 Section .134.

1.11.3 Physician's Written Opinion

Before work begins a copy of the physician's written opinion for each employee shall be obtained and furnished to the Safety and Health Manager; and the employee. The opinion shall address the employee's ability to perform hazardous waste site remediation work and shall contain the following:

- a. The physician's recommended limitations upon the employee's assigned work and/or PPE usage.
- b. The physician's opinion about increased risk to the employee's health resulting from work; and
- c. A statement that the employee has been informed and advised about the results of the examination.

1.11.4 Medical Records

Documentation of medical exams shall be provided as part of the Certificate of Worker or Visitor Acknowledgment. Medical records shall be maintained in accordance with 29 CFR 1910 Section .120, and 29 CFR 1926Section .65.

1.12 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

The Safety and Health Manager shall prepare and implement an exposure monitoring/air sampling program to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. The contractor shall monitor for the following gasses and vapors: volatile and semi-volatile organic compounds from petroleum contaminates. The contractor shall monitor these gasses with the following instruments: PID/FID. The contractor shall monitor around the disposal area for ambient dust should materials dry out and be subjected to wind erosion and entrainment. The contractor shall monitor for the following aerosolized contaminants with the following instruments: real time aerosol monitor. The Contractor shall establish dust action levels based on chromium and polyaromatic hydrocarbons concentrations detected in the sediments.

1.13 HEAT STRESS AND COLD STRESS MANAGEMENT

The Contractor shall establish heat stress and/or cold stress management programs and implement them when the ambient temperature exceeds 70°F and below 40°F respectively. The thermal stress management programs shall consist of the following procedures and practices outlined in ACBIH 2002 TLV, and BEIS, Thermal Stress Section.

1.14 SPILL AND DISCHARGE CONTROL

Written spill and discharge containment/control procedures shall be developed and implemented. These procedures shall address radioactive wastes, shock sensitive wastes, laboratory waste packs, material handling equipment, and appropriate procedures for tank and vault entry as well as drum and container handling, opening, sampling, shipping and transport as may be applicable. These procedures shall describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g. booms, vermiculite); location of the spill control material; personal protective equipment required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials shall be appropriately bermed, diked and/or contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, and/or human health or the environment are threatened, the National Response Center, the state, and the Contracting Officer shall be notified as soon as possible.

1.15 CONFINED SPACE ENTRY PROCEDURES

In the event that confined spaces, as defined by 29 CFR 1910.146(b), must be entered, the Contractor shall have a written Confined Space Entry Program which addresses the elements of 1910.146 and details how entry and rescue operations will occur.

1.16 HOT WORK

Hot work will not be permitted except as outlined herein. Prior to conducting hot work, a hot work permit shall be prepared and submitted. An example format for a hot work permit shall be included in the SSHP. The permit shall describe how hot work activities will be conducted. This should include practices and procedures, competent persons, fire watch, extinguisher requirements, duties and responsibilities, notifications, approval and emergency procedures. The hot work prohibition includes

welding, cutting, grinding, sawing, or other similar operations which could be expected to potentially generate combustion-producing temperatures or sparks, or which could produce potentially hazardous fumes or vapors. An individual at each hot work site shall be designated as a fire watch. This person's sole responsibility shall be to monitor the hot work and have immediate access to the fire extinguisher located at each hot work site. A new permit shall be obtained at the start of each work shift during which hot work will be conducted.

1.17 SITE CONTROL MEASURES

1.17.1 Work Zones

Work zone boundaries (exclusion zone, including restricted and regulated areas; contamination reduction zone; and support zone) and access points shall be established and the boundary delineations shall be included on the Contractor submitted drawings. Delineation of work zone boundaries shall be based on the contamination characterization data and the hazard/risk analysis to be performed as described in paragraph: HAZARD/RISK ANALYSIS. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval of the Contracting Officer. Work zones shall be clearly identified and marked in the field (using fences, tape, signs, etc.). A site map, showing work zone boundaries and locations of decontamination facilities, shall be posted in the onsite office. Work zones shall consist of the following:

- a. Exclusion Zone (EZ): The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area shall be controlled and exit may only be made through the CRZ.
- b. Contamination Reduction Zone (CRZ): The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas shall be separate and unique areas located in the CRZ.
- c. Support Zone (SZ): The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The Support Zone shall be secured against active or passive contamination. Site offices, parking areas, and other support facilities shall be located in the Support Zone.

1.17.2 Site Control Log

A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable), and personal protective equipment utilized. Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they shall show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and shall fill out the Certificate of Worker or Visitor Acknowledgment. This visitor information, including date, shall be recorded in the log.

1.17.3 Communication

An employee alarm system that has adequate means of on and off site communication shall be provided and installed in accordance with 29 CFR 1910 Section .165. The means of communication shall be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals shall be distinctive and recognizable as messages to evacuate or to perform critical operations.

1.17.4 Site Security

Signs shall be printed in bold large letters on contrasting backgrounds in English and/or where appropriate, in the predominant language of workers unable to read English. Signs shall be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

1.18 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the following personal hygiene and decontamination provisions. Decontamination shall be performed in the CRZ prior to entering the Support Zone from the Exclusion Zone. Chapter 10.0 of NIOSH 85-115 shall be consulted when preparing decontamination procedures. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers shall be submitted as part of the SSHP. Employees shall be trained in the procedures and the procedures shall be enforced throughout site operations. Persons disregarding these provisions of the SSHP shall be barred from the site.

1.18.1 Decontamination Facilities

The Contractor shall initially set up a decontamination line in the CRZ. Employees shall exit the exclusion zone through the CRZ and shall implement decontamination procedures and techniques. It is the site safety and health officer's responsibility to recommend techniques to improve personnel decontamination techniques and procedures, if necessary.

1.18.2 Equipment Decontamination

Vehicles and equipment used in the EZ or contaminated with site materials shall be decontaminated in the CRZ prior to leaving the site.

1.18.2.1 Decontamination Facilities

A vehicle/equipment decontamination station shall be provided within the CRZ for decontaminating vehicles and equipment leaving the EZ.

1.18.2.2 Procedures

Procedures for equipment decontamination shall be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures shall address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Any item taken into the EZ shall be assumed to be contaminated and shall be inspected and/or decontaminated before the item leaves the area. Vehicles, equipment, and materials shall be cleaned and decontaminated prior to

leaving the site. Construction material shall be handled in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination.

1.19 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

The following items, as a minimum, shall be maintained onsite and available for immediate use:

- a. First aid equipment and supplies approved by the consulting physician.
- b. Emergency eyewashes and showers which comply with ANSI Z358.1.
- c. Emergency-use respirators. For escape purposes, 5 to 15-minute emergency escape masks shall be supplied. For rescue purposes, 2 positive pressure self-contained breathing apparatus (SCBA) shall be supplied. These shall be dedicated for emergency use only and maintained onsite in the Contamination Reduction Zone.
- d. Fire extinguishers with a minimum rating of 20-A:120-B:C shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

1.20 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

An Emergency Response Plan, that meets the requirements of 29 CFR 1910 Section .120 (1) and 29 CFR 1926 Section .65 (1), shall be developed and implemented as a section of the SSHP. In the event of any emergency associated with remedial action, the Contractor shall, without delay, alert all onsite employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Employees that are required to respond to hazardous emergency situations shall be trained in how to respond to such expected emergencies. The plan shall be rehearsed regularly as part of the overall training program for site operations. The plan shall be reviewed periodically and revised as necessary to reflect new or changing site conditions or information. Copies of the accepted SSHP and revisions shall be provided to the affected local emergency response agencies. The following elements, as a minimum, shall be addressed in the plan:

- a. Pre-emergency planning. Contact the local emergency response planner during preparation of the Emergency Response Plan. The contractor shall arrange to have fire, rescue, medical and police security services provided by local emergency responders. The Contractor shall ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.
- b. Personnel roles, lines of authority, communications for emergencies.
- c. Emergency recognition and prevention.
- d. Site topography, layout, and prevailing weather conditions.

- e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).
- f. Specific procedures for decontamination and medical treatment of injured personnel.
- g. Route maps to nearest prenotified medical facility. Site-support vehicles shall be equipped with maps. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.
- h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Contracting Officer and/or their alternates).
- i. Criteria for initiating community alert program, contacts, and responsibilities.
- j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies shall be immediately notified. In addition, the Contracting Officer shall be verbally notified immediately and receive a written notification within 24 hours. The report shall include the following items:
 - (1) Name, organization, telephone number, and location of the Contractor.
 - (2) Name and title of the person(s) reporting.
 - (3) Date and time of the incident.
 - (4) Location of the incident, i.e., site location, facility name.
 - (5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
 - (6) Cause of the incident, if known.
 - (7) Casualties (fatalities, disabling injuries).
 - (8) Details of any existing chemical hazard or contamination.
 - (9) Estimated property damage, if applicable.
 - (10) Nature of damage, effect on contract schedule.
 - (11) Action taken to ensure safety and security.
 - (12) Other damage or injuries sustained, public or private.
- k. Procedures for critique of emergency responses and follow-up.

1.21 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a Contractor-generated certificate of worker/visitor acknowledgement shall be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the example certificate at the end of this section.

1.22 INSPECTIONS

The SSHO's Daily Inspection Logs shall be attached to and submitted with the Daily Quality Control reports. Each entry shall include the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer. In the event of an accident, the Contracting Officer shall be notified according to EM 385-1-1. Within 2 working days of any reportable accident, an Accident Report shall be completed on ENG Form 3394 and submitted.

1.23 SAFETY AND HEALTH PHASE-OUT REPORT

A Safety and Health Phase-Out Report shall be submitted within 10 working days following completion of the work, prior to final acceptance of the work. The following minimum information shall be included:

- a. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.).
- b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on site facilities.
- c. Summary of exposure monitoring and air sampling accomplished during the project.
- d. Signatures of Safety and Health Manager and SSHO.

Task Hazard and Control Requirements SheetHazardous Materials

The sediments in the channel have been determined to be contaminated with heavy metals, polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbon (TPH), pesticides, and polychlorinated biphenyls (PCBs). Total chromium concentrations ranged from 200 mg/kg to 2,700 mg/kg. Total PAHs ranged from 42 mg/kg to 833 mg/kg and TPH concentrations were noted at concentrations up to 10% with a very strong petroleum odor noted for many samples in the sample log summaries. PCBs, pesticides, and cadmium were detected at low ppm concentrations, while lead concentrations up to 210 mg/kg were detected. It should be expected that a strong petroleum odor will be present during the dredging of some areas. Although this project does not fall under the scope of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (Hazwoper), the Contractor should have the available resource on hand to conduct monitoring to determine exposure to site workers and the public as necessary. The Contractor shall be prepared to place personnel in personal protective equipment (PPE), establish decontamination areas for the vehicles transporting the dredged materials from the scow to the disposal site and back, provide medical attention to any employee who may report being ill as a result of the odors, and establish site work zones to ensure that contamination is not spread to non-contaminated areas. As part of the site/project orientation briefing for employees, the Contractor shall identify the site contaminants of concern, the health effects, PPE that may be required, practices and procedures to be implemented if and when contaminated material is encountered and/or handled.

Decontamination Stations

Decontamination stations shall be established at both the scow unloading area and the disposal site. Vehicles transporting the dredged sediments shall be liquid tight and dredged materials shall be removed from the wheels and exterior vehicle components prior to traveling over the roadway connecting the off-loading area and the disposal area. At a minimum, a high pressure low volume decontamination wash unit will be used. Wastewater will be contained, stored and sampled to determine proper disposal.

Personal Protective Equipment

In the event that Level D modified or Level C PPE is required, the Contractor's personnel shall have received instruction on the use, donning/doffing, limitations, inspection requirements for the PPE. In the event respiratory protection is required, medical clearance, a fit test and respiratory protection training shall have been conducted and documented.

Air Monitoring

Air monitoring provisions shall be available to identify and quantify potential exposure to employees when dealing with odorous sediment material. Real time monitors, such as a photoionization or flame detector shall be available and site action levels shall be established based on identified contaminants of concern. Additional integrated sampling provisions may be required and shall be identified in the accident prevention plan should site volatile organic compound action levels be exceeded.

Medical Surveillance

Emergency medical attention shall be available to any worker who becomes ill as a result exposure to site contaminants or becomes injured while on the job. Provisions for follow up medical will be available and paid for by the Contractor.

Site Work Zones

Spread of site contamination shall be strictly controlled. The Contractor will ensure, through the use of designated work zones, that contaminated material is contained to designated areas. These areas shall be clearly identified and access to these areas shall be strictly controlled. Any material which may spill on the public access roadways or other public or private properties shall be immediately cleaned up.

Floating Plant and Marine Activities

The Contractor shall ensure that the Accident Prevention Plant is in compliance with the requirements outlined in EM 385-1-1, Section 19, Floating Plant and Marine Activity. All vessels and floating plants not subject to USCG inspection and certification or not having a current American Bureau of Shipping (ABS) classification shall have had appropriate inspection by an Marine Surveyor accredited by the National Association of Marine Surveyors or the Society of Accredited Marine Surveyors having at least 5 year experience in commercial marine plant inspection. The inspection shall have been conducted within the previous year. All other plants shall have been inspected by a qualified person within the past year. These inspections shall be appropriate for the intended use of the vessel, and as a minimum evaluate the structural integrity of the vessel and compliance with NFPA 302, Fire Protection for Pleasure and Commercial Motor Craft. The inspection certificates shall be included in the Accident Prevention Plan and posted on the vessel safety bulletin board. The Contractor shall ensure that all other relevant requirements of Section 19 are adequately addressed.

When land based cranes are used on barges the Contractor shall ensure that the maximum list/trim of the barge does not exceed 50 degrees under maximum intended load. Land based cranes or other excavation equipment will be blocked and secured using a slack system tie down or suitable method recommended by the manufacturer. Floating cranes shall not exceed listing/trim recommendation provided by the manufacturer.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

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SECTION 01355

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements Manual
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1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes

management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G, RO.

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. Drawings showing locations of proposed temporary haul roads, material storage areas, structures, and sanitary facilities.
- f. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- g. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods

for protection of features to be preserved within authorized work areas.

h. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and the local Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

- i. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction.

- j. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

- k. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

- l. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the

intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

m. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities.

n. A historical, archaeological, cultural and biological resources plan that defines procedures for identifying and protecting historical, archaeological, cultural, and biological resources known to be on the project site, and/or identifies procedures to be followed if historical archaeological, cultural, and biological resources not previously known to be onsite or in the area are discovered. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

o. A plan to control and clean-up oils not entrained in dredged sediment; e.g., the use of oil booms and related items.

1.7.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area, off-loading area, and access route(s), as applicable. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if

the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

This paragraph supplements the Contractor's responsibility under the contract clause "PERMITS AND RESPONSIBILITIES" to the extent that the Government has obtained a Wetlands Permit from the State of New Hampshire Department of Environmental Services for this project. The Contractor shall comply with the terms and conditions of this permit which is attached at the end of this section. Applicable permit requirements have been incorporated into the contract drawings and specifications.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any work, the Contractor shall identify any land resources to be preserved within the work area. The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings or by the Contracting Officer to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation. All water areas affected by construction activities shall be monitored by the Contractor.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain haul roads, permanent and temporary access roads, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of New Hampshire rules.

3.4.4 Burning

Burning is prohibited on the project site.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Solid wastes shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off of the project site and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations.

The Contractor shall transport Contractor generated hazardous waste off of the project site within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work requiring fuel is performed.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.9 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.10 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual

pollution standards; installation and care of devices and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.11 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with the Contract Clause "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

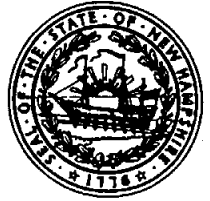
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State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-2147 FAX (603) 271-6588

July 17, 2002



Mr. George R. Meyer, Executive Director
Pease Development Authority
Division of Ports and Harbors
Attention: Engineering Department
360 Corporate Dr.
Portsmouth, NH 03802-0369

RE: NH DES Wetlands File #2001-00932-Dover-Cocheco River

Dear Mr. Meyer:

The Department of Environmental Services ("DES") Wetlands Bureau has reviewed and approved Wetlands Application #2001-932 as submitted by the Pease Development Authority Division of Ports and Harbors ("DPH") to dredge approximately 45,000 cubic yards of sediment over 2.7 miles of the Cocheco River federal navigation channel to restore the channel to its original federally authorized dimensions. This will serve as a decision on Wetlands Application #2001-932 and for use by the New Hampshire Office of State Planning ("OSP") to review whether the project is consistent with the New Hampshire Coastal Program, as required by Section 307(c) of the Coastal Zone Management Act ("CZMA").

Based on analysis of the information submitted the DPH, Army Corps of Engineers, City of Dover, and other interested parties during the public comment period, theDES has concluded that the applicant has reasonably established that the proposal will accomplish the project purpose in a manner that, with implementation of all conditions stated in the approval, is in accordance with DES wetlands requirements under RSA 482-A and hence is approved.

The Army Corps of Engineers ("Corps") has been requested by Congress to perform dredging of the Cocheco River to restore the channel to the dimensions originally authorized by Congress, and constructed in the 1800's, as a federal navigation project. The dredging will remove sediments which have accumulated at various intermittent locations throughout the 27 mile stretch and which represent impediments to navigation. This represents the public interest of the project as required by Wt 302.01 (a), and the demonstrated need of the project, per Wt 302.04 (a)(1).

The project area is identified, per the requirements of Wt 302.04 (a)(3), as an estuarine system consisting of tidal open water, inter-tidal mud flats, salt marsh, and rocky shore. The surface area of the wetlands to be directly impacted is identified, per the requirements of Wt 302.04(a)(6), as approximately 690,000 square feet. The in-river volume to be removed is approximately 45,000 cubic yards.

This project has received extensive public and resource agency review and input. This project has received coordinated inter-agency review with DES, OSP- NH Coastal Program, the Corps, National Marine Fisheries Service, US Fish and Wildlife Service, US Environmental Protection Agency ("U.S. EPA"), NH Dredge Management Task Force, and NH Fish and Game Department. The applicant has responded to agency requests for more information with thorough, detailed technical data.

A public hearing on the project was held on May 14, 2002, during which public testimony and questions were taken. A follow-up hearing was also held on June 6, 2002 at which representatives of the City of Dover and the Corps provided additional technical information in response to a number of questions submitted at the May hearing.

With regard to meeting the least impacting alternative and impact avoidance and minimization requirements per Wt 302.03 and Wt 302.04(a)(2) respectively, the applicant has demonstrated the following efforts:

- Dredging will be confined to the authorized channel, with associated over-dredge allowances. The project addresses only areas where sediment has accumulated in the channel and does not dredge where the Corps' conditions survey documents channel depth is at the authorized 7 feet mean low water. This reduces the dredging to approximately 65 % of the actual overall 2.7 miles of channel area. The 218 acres of vegetated wetlands within this stretch of river will not be touched.
- Impacts will be further minimized by the imposition of the November 15th - March 15th dredge window (per Wt 304.11(b) which confines dredging activities to the period of least activity for anadromous fish and other aquatic species, and period of dormancy for most plants.
- Consideration was given to the type of dredge to be used, and it has been determined that a closed top clamshell bucket will be the least impacting dredge method in this particular river considering the length of the river, the time of year of dredge, and nature of substrate materials as documented in the boring data. The closed top clamshell bucket is superior to the open clamshell bucket in containing spillage during the dredging operations and it will also enable the dredge to proceed relatively quickly. The hydraulic dredge and environmental bucket were also considered. The hydraulic dredge is prone to break down and failure if used in conditions which involve over-extension with booster pumps, clogging with large rocks or woody debris, or freezing in winter conditions, all of which apply to the Cocheco project. The environmental bucket is also prone to failure if its seal is compromised with

7/17/02

- rocks or wood. Both types entrain more water than conventional bucket dredge, thereby reducing the volume of sediment retrieved, which making progress, slower and less productive, even without failures. If the dredging is too slow, there is substantially less potential that the project can be fully completed within the dredge window.

The Corps and the applicant have identified the wildlife, fisheries, aquatic organisms, and vegetated resources inherent in this estuarine system. The fisheries resources, primarily anadromous species would be the most sensitive to dredge impacts. The primary source of impact from the dredging project has been identified as the turbidity from suspended sediments and mobilization of contaminants. The Corps has conducted surveys of the existing channel condition bathymetry, water quality analysis, sediment borings, sediment chemical analysis, elutriate quality testing and modeling of suspended sediment plume movement. Data analysis through application of the DREDGE model and application of the elutriate data to water column analysis has also been performed.

Turbidity caused by dredge operations is expected to settle out within a few hours and within tens of meters from the barge and will be in the order of turbidity of a storm event. Higher turbidity immediately at the dredge is expected to dissipate within 24 hours so the short term environmental effects are expected to be minimal.

The nature and potential effects of contaminated sediment on plants, fish, and wildlife, and abutting property owners were also considered. Sediment samples were collected from 59 representative sampling locations within the river, specifically identifying contamination locations per the requirements of Wt 304.11 (d). Analysis for PCBs, arsenic, chromium, and polynuclear aromatic hydrocarbons ("PAHs") indicated detectable, but relatively low, levels of these contaminants in some samples. Based on these analyses and predictive modeling, these contaminants should not be present during the dredge at levels that exceed applicable marine water quality criteria or human health exposure guidelines. Furthermore, this project benefits the estuary in the long term by reducing the overall mass of contaminants contained within the river by the removal of accumulated sediment from the river.

The decision to approve this project was also based on the following findings:

Findings

1. This is a major impact project per Wt 303.02 (a) as a project in tidal wetlands, and per Wt 303.02 (k), projects in a wetland that have been identified by Natural Heritage Inventory as having documented occurrences of state listed Threatened species.

2. This is a federally authorized navigation project which will restore historical channel dimensions created in the 1800's to the Cocheco River, to remove impediments to navigation.
3. This dredge project will be carried out by the Army Corps of Engineers. It has received coordinated review among state and federal agencies, including DES, OSP, N. H. Fish and Game Department, N.H. Dredge Management Task Force, Corps, National Marine Fisheries Service, U.S. EPA, and U.S. Fish and Wildlife Service.
4. DES personnel conducted field inspections of the project area on September 14, 2000, and again on August 7, 2001 in coordination with Pease Development Authority – Division of Ports and Harbors and OSP, and found that authorized channel water depths were diminished in a number of locations throughout the project area of the Cocheco River.
5. Pursuant to RSA 482-A:8, a public hearing was held for this project on May 14, 2002. A second, follow-up hearing was held on June 6, 2002 to provide additional technical presentations and responses to questions raised at the May hearing, and the opportunity to raise additional technical questions. Written comments were also received and considered by DES in this decision.
6. Impacts on nearby wetlands and surface waters, the impact of the project on the quantity or quality of surface or groundwater, and the impact on the total wetland complex, per Wt 302.04 (a) (4), Wt 302.04 (a) (13) Wt 302.04 (a) (17) respectively, have also been considered.
7. The issue of potential impacts of suspended sediment was evaluated. Use of the SSFATE model by the Corps predicted that, typical of other dredges, the sediment will settle out in a few hours and that within tens of meters of the barge the sediment will be within the realm of turbidity of a storm event, approximately 1-25 parts per million ("ppm"). Higher turbidity will be found immediately at the dredge but which is predicted to dissipate within 24 hours. SSFATE model does indicate higher concentration points in inlet or cove type areas of the river.
8. Sediment sampling revealed contaminant levels that were within the expected range expected for the Cocheco River and, more broadly, the Great Bay Estuary system. For comparison purposes, PCB's and pesticides were below "NH S-1" levels, as established in the DES Risk Characterization and Management Policy (RCMP). NH S-1 is the level for contaminated upland soils below which there is very low risk of health effects to sensitive human populations, such as young children, from chronic exposure. One arsenic result exceeded NH S-1, however, arsenic is naturally occurring in marine clay,

which is an underlying substrate of the river. All other metals tested in sediments were below NH S-1, except for chromium.

9. Chromium was detected in the upper 10-inches of sediment, most likely due to historic industrial activity upstream of the dredge site in Dover. The highest reported concentration of chromium in sediment was 2,700 ppm as compared with the NH S-1 level of 1,000 ppm and short term occupational exposure (NH S-3) level of 5,000 ppm. Elutriate sampling indicated chromium concentrations of about 41 ppb, far below applicable marine and freshwater acute and chronic water quality criteria of 10,300 ppb.

10. Since the dredge will occur between November and March, no significant human contact with the sediments or downstream water column will occur during the dredge window. Furthermore, sediment migration caused by the dredge will not cause measurable changes in contaminant concentrations downstream sediments.

11. PAHs were also detected in sediments at levels that exceed RCMP guidelines for some compounds. These compounds are likely associated with oil or other fossil fuels and are typical of river systems with industrial histories such as the Cocheco River. Elutriate testing by the Corps and DREDGE modeling predicted that, during the dredge, total dissolved PAHs would be below applicable surface water quality criteria. The DREDGE model also predicted that dissolved concentrations of PAHs close to the barge, where temporary disturbance will be most intense, will be substantially below the marine and freshwater acute and chronic water quality criteria of 300 ppb. Corps modeling efforts predicted similar results within 100 feet of the barge. Furthermore, the potential for human contact during the dredging is minimal.

12. Issues were raised by public comment concerning bottom stability and bank stability, criteria for consideration per Wt 302.02(a)(14) and (15), a project's resulting increase in erosion, and redirection of wave energy, respectively. Sedimentation is predicted to occur at the relatively slow rate of one inch every ten years, indicating a stable condition. Furthermore, after dredging, the channel bottom is expected to be relatively stable because the native materials below the sediment layer are predominantly clay.

13. Issues have been raised with respect to the impact of the project on fish and wildlife, criteria for consideration under Wt 302.04 (a)(7)(d). Although some shellfish and benthic species are removed with most dredge operations, the effects are temporary and the species recolonize. Six single clam locations and one oyster location were documented for this project. An actual shellfish field documented by the DES Shellfish Program is located outside the Cocheco, in the Salmon Falls/Piscataqua River area. Effecting anadromous fish and other wildlife and waterfowl will be minimized by confining the operation to the dredge window when fish and wildlife activity is at a minimum.

14. The potential for impacts on the Piscataqua River and Great Bay was also raised by public comment. Great Bay particularly with respect to Wt 302.04(a)(19) as an area named in an act of Congress (Great Bay National Estuarine Research Reserve, and Great Bay National Wildlife Refuge). The Army Corps SSFATE model indicates that the sediment cloud will travel approximately 1,500 feet as it dissipates, therefore at the furthest point of the dredge at the confluence of the Cocheco with the Piscataqua the cloud will extend approximately 1,500 feet into the Piscataqua. SSFATE modeling has established that concentrations of total suspended solids and contaminated constituents will be below marine acute or chronic surface water quality criteria, therefore should have no effect on Great Bay far downstream.

15. Disposal of dredge spoils is proposed to be to a dredge disposal landfill located on land owned by the City of Dover. This landfill has been approved by the DES Waste Management Division to be constructed in conjunction with this project. As a result, the applicant has provided an acceptable method for disposal of the dredged materials that ultimately removes these materials from wetlands jurisdiction. Detailed concerns with respect to long-term maintenance and liability of the City of Dover for dredge cell maintenance were raised in public comment. Concerns pertaining to disposal cell operation, maintenance and financing fall outside of the scope of this decision but are addressed under a separate regulatory process under the Waste Management Division to the extent that there is state jurisdiction.

16. Approval of this federal navigation project does not in any way set precedent for, or imply approval by the Department for the construction of the dug in shoreline depicted in one conceptual drawing included in the application materials, nor for the 100 slip marina referred to in the application.

The decision to approve this project was also based on the following conditions:

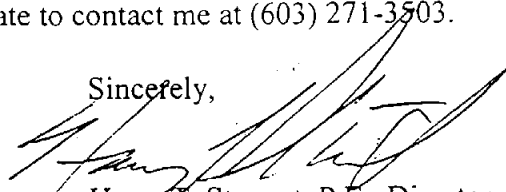
Conditions:

1. Any future work in jurisdiction as specified in RSA 482-A on this property will require a new application and approval by the Department of Environmental Services.
2. All work shall be in accordance with plans by the U.S. Army Corps of Engineers and Geo Insight dated 2/15/01 and 5/3/02 as received by the Department on 5/24/01 and 5/14/02, respectively; and narrative technical materials dated 5/9/02 and 6/20/02 as received by the Department on 5/9/02 and 6/24/02 respectively.
3. This project shall be coordinated with the U.S. Army Corps of Engineers and affiliated federal resource agencies.

4. All dredging and dredge materials disposal shall occur between November 15th and March 15th as required by administrative rule Wt 304.11.
5. Prior to the initiation of dredging, DES shall be provided with documentation including final plans when a decision has been made as to whether the channel will be relocated or bedrock blasting will occur in Reaches 5 and 7.
6. Prior to the initiation of dredging, DES shall be provided with a project operation plan or equal as to how any release of oil not entrained in sediment will be handled, including control and clean-up procedures.
7. Prior to the initiation of dredging, DES shall be provided with plans and narrative description for the erosion/siltation controls to be employed at the off-loading location to ensure that no re-release of sediments back into the river will occur during the transfer of spoils from the barge to trucks, and the movement of the trucks in and out of the transfer area.
8. Appropriate siltation/erosion/turbidity controls shall be in place prior to construction, shall be maintained during construction, and remain until the area is stabilized. Silt fence(s) must be removed once the area is stabilized.
9. Dredged material shall be placed out of any area that is within the jurisdiction of the DES Wetlands Bureau, as coordinated and approved by the DES Waste Management Division.
10. This permit is valid for five years from the date of issuance. Within this time period, any further maintenance dredging/dredged materials disposal, after the proposed project is accomplished, shall require notification and review by DES.

If you have any questions, please do not hesitate to contact me at (603) 271-3503.

Sincerely,



Harry T. Stewart, P.E., Director
Water Division

HTS/daw

cc: See Attached List

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SECTION 01420

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SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1819 L Street, NW, 6th Floor
Washington, DC 20036
Ph: 202-293-8020
Fax: 202-293-9287
Internet: <http://www.ansi.org/>

Note --- Documents beginning with the letter "S" can be ordered from:

Acoustical Society of America
Standards and Publications Fulfillment Center
P. O. Box 1020
Sewickley, PA 15143-9998
Ph: 412-741-1979
Fax: 412-741-0609
Internet: <http://asa.aip.org>
General e-mail: asa@aip.org
Publications e-mail: asapubs@abdintl.com

ASTM INTERNATIONAL (ASTM)

100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
Fax: 610-832-9555
Internet: <http://www.astm.org>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
Ph: 617-770-3000
Fax: 617-770-0700
Internet: <http://www.nfpa.org>

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

Mail Stop C-13
4676 Columbia Parkway
Cincinnati, OH 45226-1998
Ph: 800-356-4674
Fx: 513-533-8573
Internet: <http://www.cdc.gov/niosh/homepage.html>
To order pubs for which a fee is charged, order from:
Superintendent of Documents
U.S. Government Printing Office
732 North Capitol Street, NW
Mailstop: SDE
Washington, DC 20401
Ph: 866-512-2800 or 202-512-1800
Fax: 202-512-2250
Internet: <http://www.gpo.gov>

U.S. ARMY CORPS OF ENGINEERS (USACE)

Order CRD-C DOCUMENTS from:

U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services
Branch, TIC
3909 Halls Ferry Rd.
Vicksburg, MS 39180-6199
Ph: 601-634-2664
Fax: 601-634-2388
Internet: <http://www.wes.army.mil/SL/MTC/handbook/handbook.htm>

Order Other Documents from:

USACE Publications Depot
Attn: CEIM-SP-D
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
Internet: <http://www.usace.army.mil/publications>
or <http://www.hnd.usace.army.mil/techinfo/index.htm>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

700 Pennsylvania Avenue, N.W.
Washington, D.C. 20408
Phone: 866-325-7208
Internet: <http://www.archives.gov>

Order documents from:

Superintendent of Documents
U.S. Government Printing Office
732 North Capitol Street, NW
Washington, DC 20401
Mailstop: SDE

Ph: 866-512-1800 or 202-512-1800
Fax: 202-512-2250
Internet: <http://www.gpo.gov>
E-mail: gpoaccess@gpo.gov

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SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the total project costs.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 15 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 14 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by

subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves

the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting.

During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of two years in related work. This CQC System Manager shall be on

the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved

shop drawings or submitted data, and are properly stored.

- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including

control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 COMPLETION INSPECTION

3.7.1 Final Acceptance Inspection

See Section 01723 FIELD ENGINEERING FOR DREDGING.

3.8 CONTRACTOR SURVEYS

3.8.1 Survey Personnel

The Contractor survey work to be performed under this contract shall be accomplished by, or reviewed and approved by, a surveyor familiar with and having personal experience with hydrographic surveys. In addition, the survey personnel shall also be familiar with and have personal experience with hydrographic surveys.

3.8.2 Survey Plans

The Contractor shall submit, as part of the Quality Control Plan a detailed proposal setting out the method of surveying. Prepare a plan describing the survey methods to be used:

- a. to complete the layout and sequencing of the work;
- b. to conduct the quality control surveys.

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

A sample "Daily Construction Quality Control Report" is attached at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

QUALITY CONTROL REPORT- BUCKET/PIPELINE DREDGE										
CONTRACT NO.		CONTRACT TITLE			CONTRACTOR		DATE		REPORT NO.	
CHARACTER OF WORK		<input type="checkbox"/> MAINTENANCE <input type="checkbox"/> NEW WORK <input type="checkbox"/> ENVIROMENTAL								
DREDGE		NAME		SIZE	PIPELINE			DIPPER OR BUCKET SIZE		
		HORSEPOWER OF		DREDGE PUMP		SUCTION PIPE JET		CUTTER OR BUDGET		
		NO. OF CREW MEMBERS	DREDGE	SHORE	OTHER PLANT	TOTAL	WORK SCHEDULE	SHIFTS PER DAY	DAYS PER WEEK	
LOCATION/CHANNEL OF WORK										
LOCATION OF WORK		REACH DREDGED STATION. TO STATION		DISPOSAL AREA USED		QTY DEPOSITED GROSS (CY)		CUMULATIVE AND QTY DEPOSIT FOR DA (CY)		
CHARACTER OF MATERIAL (%)		GRAVEL_____		SAND_____		CLAY_____		MUD_____		SILT_____
		HARDPAN_____		STONE_____		SHELL_____		OTHER_____		
CHANNEL CONDITION		AVERAGE DEPTH		BEFORE DREDGING_____			AFTER DREDGING_____			
RIVER/TIDE STAGE		MIN	TIME		MAX		TIME		GAGE LOCATION	
		MIN	TIME		MAX		TIME		GAGE DATUM	
WEATHER CONDITION		WEATHER		TEMP		VISIBILITY			WIND	
WORK PERFORMED					DISTRIBUTION OF WORK					
ITEM		UNIT		QUANTITY		EFFECTIVE WORKING TIME (CHARGEABLE TO COST OF WORK)			HR.	MIN.
AVERAGE WIDTH OF CUT		FT				PUMPING OR DREDGING				
TOTAL ADVANCE THIS PERIOD		FT				PCT OF EFFECTIVE TIME		%		
TOTAL ADVANCE PREVIOUSLY		FT				BOOSTER (IN LINE)				
TOTAL ADVANCE TO DATE		FT				NON-EFFECTIVE WORKING TIME (CHARGEABLE COST TO WORK)				
FLOATING PIPE_____		SHORE PIPE_____		SUBMERGED PIPE_____		HANDLING PIPE LINES				
TOTAL LENGTH OF DISCHARGE PIPE		FT				HANDLING ANCHOR LINES				
____ H.P. BOOSTER ADDED @ ____ FT TO DA _____						CLEARING PUMP AND PIPE LINES				
____ H.P. BOOSTER ADDED @ ____ FT TO DA _____						CLEARING CUTTER OR SUCTION HEAD				
CUBIC YARDS REMOVED		GROSS		CREDITED		WAITING FOR SCOWS				
AMOUNT DREDGED THIS DATE						TO AND FROM WHARF OR ANCHORAGE				
AMOUNT PREVIOUSLY REPORTED						CHANGING LOCATION OF PLANT ON JOB				
TOTAL AMOUNT DREDGED TO DATE						LOSS DUE TO OPPOSING NATURAL ELEMENTS				
AMOUNT DREGGED PER PUMPING/CUTTING HR						SHORE LINE AND SHORE WORK				
						WAITING FOR BOOSTER				
						MINOR OPERATING REPAIRS (EXPLAIN IN REMARKS)				
OPERATING SUPPLIES					WAITING FOR ATTENDENT PLANT					
COMMODITY		CONSUMED		CREDITED		PREPARATION AND MAKING UP TOW				
ITEM	UNIT	QUANTITY		QUANTITY		TRANSFERRING PLANT BETWEEN WORKS				
FUEL	BBL					LAY TIME OFF SHIFT AND SATURDAYS				
						SUNDAYS AND HOLIDAYS				
ELECTRICITY	KW					FIRE DRILL				
LUBRICANTS	GAL					MOVING OUT OF WAY OF TRAFFIC				
						MISCELLANEOUS (EXPLAIN IN REMARKS)				
						TOTAL NON-EFFECTIVE TIME				
						PCT. OF NON-EFFECTIVE		%		
MOB DATE: _____		DREDGE START: _____		DEMOB DATE: _____		TOTAL EFFECTIVE AND NON-EFFECTIVE TIME (CHARGEABLE TO COST OF WORK)				

QUALITY CONTROL REPORT-PIPELINE DREDGE

CONTRACT NO.		CONTRACT TITLE		CONTRACTOR		DATE		REPORT NO.					
ATTENDANT PLANT													
ITEM	NAME OR NUMBER	H.P.	HOURS										
										LOST TIME			
										(NOT CHARGEABLE TO COST OF WORK)			
										MAJOR REPAIRS AND ALTERATIONS			
										CESSATION			
										COLLISIONS			
										MISCELLANEOUS			
										TOTAL LOST TIME			
										PERCENTAGE OF TOTAL TIME		%	
										TOTAL TIME IN PERIOD			

NARRATIVES

SCOW LOAD CARD

TRIP #

DATE

SCOW #

MEASUREMENTS AT THE JOB

POCKET # DEPTH CU. YARDS

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

TOTAL CU. YARDS _____

MEASUREMENTS AT THE DUMP

POCKET # DEPTH CU. YARDS

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

TOTAL CU. YARDS _____

NOTE : THE DEPTH IS THE DISTANCE BETWEEN THE TOP OF THE COMBING
MEASURED DOWN TO THE MATERIAL IN THE POCKET IN TENTHS.

PLEASE STAPLE THIS AND THE COMPUTER PRINTOUT TO THE
INSPECTORS DUMP LOG BY THE TRIP NUMBER.

DAILY WORK REPORT

Job Location _____ Dredge _____ Date _____.

Operator _____ Shift _____ Weather _____.

Type Material - Sand _____ Mud _____ Clay _____ Silt _____ Other _____.

[illegible]

OPERATOR SIGNATURE _____

[illegible]

HYDRAULIC FLUID		
GREASING		

GREASING

INSPECTOR'S DAILY REPORT OF DISPOSAL BY SCOW

Permittee _____

Disposal Area _____

Permit/Contract No. _____

Date _____

Project _____

Towboat _____

Dredging Contractor _____

Owner _____

Trip No.	Scow No.	Started From Place	From Time	Disposal Time	Returned To Place	To Time	Round Trip Time	Trip Dist.	Loran C or Lat/Long Coord.* Specified	Actual	Dist./Dir. From Buoy

Trip No.	No. Pockets Loaded	Dumped	Reason Pocket Not Dumped	Disposal Depth	Speed	Weather	Sea Conditions/Visibility	Scow Load (Cu. Yds.)	Scow Draft

Comments:

*Use Loran C values unless unavailable.

Time On	Time Off	Hours on Duty	Reviewed By Permittee's Representative/ Resident Inspector
Total Hours On Duty			

To the Division Engineer, US Army Engineer Division, New England, Waltham, MA:
I certify that I informed the tug captain of the conditions of the U.S. Army Corps of Engineers permit regarding the distance from the buoy and the speed of scow during the release of the dredged material. I also informed the captain that failure to comply with these conditions would constitute a violation of the permit and would be reported to the Corps. I certify that this report is correct and that I am not an employee of the dredging or towing firm, or the permittee, nor have I been employed by any of them at any time during the past 6 months.

(Signature of Inspector)

(Certification No.)

Print Name Here: _____

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SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Site Plan; G, RO.

Sketch of the proposed location and dimensions of any area to be used by the Contractor for storage and staging, the number of trailers to be used, avenues of ingress/egress to the areas and details of improvements.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety and Health Requirements Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2002) National Electrical Code

1.3 SITE PLAN

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be used by the Contractor, the locations of fences, the number of trailers to be used, and avenues of ingress/egress to the fenced area and details of the fence installation, as appropriate. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired. The Site Plan shall be laid out to follow the designated areas (Z, CRZ, SZ) as set forth on Contractor submitted drawings.

1.4 EMPLOYEE PARKING

Contractor employees shall park privately owned vehicles in an area within the support zone as designated by the Contracting Officer.

1.5 AVAILABILITY OF UTILITIES

The Contractor shall provide service required for construction operations. All water and electricity that may be required in the prosecution of the work shall be furnished by the Contractor at his own expense. There will be no Government furnished water and electricity at the project site.

1.5.1 Temporary Utility Connections

The Contractor, at his own expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines; and he shall remove them prior to final acceptance of the construction.

1.5.2 Temporary Electrical System

All required temporary electrical equipment and lines shall be furnished, installed, connected, and maintained by the Contractor according to the EM 385-1-1, Section 11.D, and shall be removed prior to final acceptance of the work. Temporary wiring shall conform to Article 305 of NFPA 70. Materials and equipment need not be new, but must be in good repair and serviceable condition. Prior to being energized, the systems and devices will be checked and approved for polarity, continuity of ground, and resistance to ground. Periodic inspections of systems and devices will be made by the Contractor at intervals not to exceed one (1) week.

1.6 COMMUNICATION SERVICE

The Contractor shall provide telephone and marine radio service, including a minimum of five telephone lines, to Contractor and Government field offices. The Contractor shall also make available to the Government Inspector, either at the Contractor's field office or at the Government field office, a copy machine and a fax machine.

1.7 SANITATION

Adequate sanitary conveniences as specified in Section 2.B of EM 385-1-1 for the use of persons employed on the work shall be provided, properly secluded from public observation, and maintained by the Contractor in such a manner as required or approved by the Contracting Officer. These conveniences shall be maintained at all times without nuisance. Upon completion of the work, the conveniences shall be removed by the Contractor from the premises, leaving the premises clean and free from nuisance.

1.8 PROTECTION AND MAINTENANCE OF TRAFFIC

The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by

construction operations.

1.8.1 Haul Roads

The haul road from the off-load area to the disposal facility is a public road owned and maintained by the City of Dover, New Hampshire. The haul road is partially bituminous paved and partially gravel surfaced.

PART 2 PRODUCTS

2.1 CONTRACTOR'S TEMPORARY FIELD OFFICES

The Contractor shall provide and maintain administrative field office facilities within the designated area, in the support zone. Government office facilities will not be available to the Contractor's personnel.

2.1.1 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the project site.

2.2 CONTRACTOR'S STORAGE AREA

Storage area will be provided to the Contractor at the Preconstruction Conference. Area will be made available for one office trailer, pickup truck parking, and other minor materials. The Contractor shall confine his storage areas to the limits as designated or approved by the Contracting Officer and shall be responsible for the security of the areas. Upon completion of the contract, the Contractor shall remove all equipment and materials, except as otherwise specified, and restore the site to its original condition as approved by the Contracting Officer, at no additional cost to the Government.

2.2.1 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion.

2.2.2 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

2.3 GOVERNMENT FIELD OFFICE (For Government Use Only)

The Contractor-provided Government field office shall be a trailer approximately 10' x 25'. An acceptable trailer is Model Mc-1040, as manufactured by McCarthy, or approved equal. The trailer shall include, as a minimum, three telephone lines, two overhead shelves, double desk with

pedestal, 36" x 72" plan table, moveable office desk, chairs for all desks, enclosed toilet, telephone, potable hot and cold drinking water and cups, hand cleaner and paper towels, and one partition. Doors shall be provided with cylinder locks and six keys shall be furnished to the Government. Office or space shall be weathertight, free of drafts, and have enough windows to provide adequate natural light as necessary. Office shall be equipped with adequate heating, lighting, and ventilation facilities.

PART 3 EXECUTION

3.1 CLEANING DURING CONSTRUCTION

3.1.1 Daily Cleaning

The Contractor shall execute daily cleaning to keep the work, the site, and adjacent properties free from accumulation of waste materials, rubbish and windblown debris, resulting from construction operations.

3.1.2 On-Site Container

The Contractor shall provide on-site containers for the collection of storage and staging area waste materials, debris, and rubbish.

3.1.3 Removal of Waste

The Contractor shall remove waste materials, debris, and rubbish from the site periodically and dispose of in accordance with applicable laws and regulations.

3.1.4 Burning

No burning of trash or debris will be permitted at the site.

3.2 GOVERNMENT FIELD OFFICE

The Contractor shall provide all services and supplies in connection with maintaining the Government field office trailer including cleaning, janitorial services, heating, lighting, water supply, and sanitary services. The trailer shall be located by the Contractor where directed by the Contracting Officer. No separate payment will be made for the trailer and all costs shall be included in the items comprising the bid schedule. The trailer, after completion of the work, will remain the property of the Contractor and shall be removed from the site. The trailer shall be secured against overturning by an approved anchorage system suitable to a coastal environment exposed to high winds.

3.3 SECURITY AT THE SITE

The Contractor shall be responsible for site security during the course of the work.

3.4 REMOVAL OF TEMPORARY MATERIALS AND EQUIPMENT

The Contractor shall remove temporary materials, equipment, services, trailers, and construction prior to completion of work. Clean and repair damage caused by installation or use of temporary facilities. Return site to pre-construction condition.

3.5 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from the site, the fence (if used) shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including topsoil and seeding as necessary.

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SECTION 01545

DREDGING PLANT AND EQUIPMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Plant and Equipment

Submit a schedule of the plant and equipment the Contractor intends to employ in the performance of the work of this contract. Submit also copies of all applicable inspections and certifications for all floating plant and equipment.

1.3 PLANT AND EQUIPMENT

The Contractor's equipment shall be capable of navigating the channel in its present condition. No time extensions or additional costs will be considered if the Contractor's equipment is delayed due to the conditions of the river.

1.3.1 Sufficient Capacity

The Contractor shall keep on the job sufficient plant and equipment to meet the requirements of the work. The plant and equipment shall be in satisfactory operating condition and be capable of safely and efficiently performing the work. The plant and equipment shall be subject to inspection by the Contracting Officer and/or his representatives at all times.

1.3.2 Minimum Capacity

The plant and equipment listed on the Plant and Equipment Schedule submitted with the Contractor's bid is the minimum which the Contractor shall place and keep on the job unless otherwise determined by the Contracting Officer. The listing of plant and equipment is not to be

construed as an agreement on the part of the Government that the equipment is adequate to perform the required work.

1.3.3 Reduction in Capacity

No reduction in the capacity of the plant and equipment employed on the work shall be made except by written permission of the Contracting Officer.

The measure of the capacity of the plant and equipment shall be its actual performance on the work covered by this contract.

1.3.4 Inspections and Certifications

Prior to commencement of work at the site, the Contractor shall make available to the Contracting Officer Representative for review, copies of all applicable inspections and certifications of floating plant and equipment as required by Federal, State and local laws and regulations. See also EM 385-1-1, Sections 16, 19, and 20. Such inspections and certifications shall be current and maintained in force for the duration of this contract. Each item of floating plant and equipment shall have on board a waste oil management plan which details the intended disposal method for waste oil.

1.4 LICENSE REQUIREMENTS

Each vessel exceeding twenty-six feet in length, excluding sheer, which is used for pushing, hauling alongside, or any other method of towing, and not required by law to have a valid Certificate of Inspection by the U.S. Coast Guard, shall be under the actual direction and control of a person licensed for towing in the geographic area of the work by the U.S. Coast Guard. Licensed persons shall not perform command or other duties in excess of twelve hours in any consecutive twenty-four hour period except in an emergency.

PART 2 PRODUCTS (Not Used)

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SECTION 01723

FIELD ENGINEERING FOR DREDGING

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Engineering Services

The Contractor shall furnish the required personnel, equipment, instruments, and transportation, as necessary to accomplish the required surveys. Reports and other data together with supporting material developed during the prosecution of the work shall be furnished to the Government. The Contractor shall also provide adequate professional supervision and quality control to assure the accuracy, quality, completeness, and progress of the work.

The Contractor shall provide and pay for the following field engineering services for the project:

- a. Hydrographic and other survey work specified or required in execution of this project, except for surveys performed by the Government, as indicated in these specifications.
- b. Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.

1.2 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referenced in the text by basic designation only. The Army Corps of Engineers references below may be viewed or downloaded free of charge via the Internet (<http://www.hnd.usace.army.mil/techinfo/>).

U.S. ARMY CORPS OF ENGINEERS (USACE)

- | | |
|----------------|--|
| EM 1110-1-1002 | (1996) Survey Markers and Monumentations |
| EM 1110-2-1003 | (2002) Hydrographic Surveying |

1.3 DEFINITIONS

1.3.1 Survey Datum

The contract drawings refer to Mean Lower Low Water (MLLW) . The Government will and the Contractor shall perform all surveys using the Mean Lower Low Water (MLLW) datum. The Contractor shall calibrate GPS equipment to the Corps of Engineers existing horizontal control net (NAD27).

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Survey Plans; G, RO.

The Contractor shall submit, as part of the Quality Control Plan, a detailed plan describing the survey methods to be used during the work. The plan shall include the equipment to be utilized, tidal data, general site plan map, line designation map, calibration procedures to be used, expected horizontal and vertical accuracies, and pertinent information to describe the methods, and results to be obtained. Field surveys shall not begin until these plans are approved.

Layout Plan; G, RO.

A complete plan of the dredging areas showing the horizontal layout of all physical and electronic ranges to be used for horizontal control. The drawings shall be drawn at a scale sufficiently large to show all pertinent details. The drawings shall be submitted as blue or black lines on a white background.

Charts.

Current and tide charts to be used for the area(s) being dredged shall be submitted.

Survey Personnel.

Furnish a listing of the personnel who will perform the survey work required by this contract. The listing shall include a brief summary of the hydrographic survey experience of each person. The list shall be submitted prior to the preconstruction conference.

SD-05 Design Data

Field Survey Data.

Submit field data; depth sounder rolls, corrected for tide, and corresponding boat plots; daily logs; and quantity computations. Submit data sufficient for the Government to reproduce the Contractor's survey plot by referring only to this field data.

The electronic field data, including XY coordinates (points), and Z depths (elevations) in ASCII file format, shall be submitted on a daily basis with the CQC reports. Deficiencies shall be corrected and a re-survey of the area shall be performed, as necessary to ensure correction has been achieved. Data shall be submitted in a readable and usable format, utilizing industry recognized standard file formats and extensions. Data shall be submitted with a commercially available software program and technical support to provide the on-site capability to read and

print the data.

1.5 GENERAL HYDROGRAPHIC SURVEY REQUIREMENTS

All hydrographic surveys for this project shall follow the mandatory criteria given in EM 1110-2-1003 for the "Navigation and Dredging Support Surveys" class of survey as a minimum.

Survey lines may be run at 50 foot offsets longitudinal to the channel limits at 25 foot offsets. The lines shall clearly identify the toe and extend out to a minimum of three times the project depth to accurately depict the side slope.

1.6 HORIZONTAL POSITIONING PROCEDURES AND ACCURACIES

a. Vessel positioning systems utilized on this contract shall conform with the allowable horizontal positioning accuracy requirements for dredging in EM 1110-2-1003. The positioning system used shall be capable of meeting or exceeding the accuracy requirements and shall not exceed the allowable ranges where indicated. The Contractor may be required to demonstrate to the Government that its positioning system is capable of meeting or exceeding the accuracy requirements in EM 1110-2-1003.

b. All dredges, all survey vessels, and all towing equipment engaged in transport of dredged material, shall be equipped with automated electronic positioning and progress track-plotting equipment having a degree of accuracy commensurate with EM 1110-2-1003.

1.7 REFERENCE HORIZONTAL CONTROL DATA

At the preconstruction conference, the Government will provide project control from which hydrographic surveys may be extended. This control shall be presumed to meet the accuracy requirements in EM 1110-2-1003. The Contractor shall immediately notify the Contracting Officer if existing control points have been disturbed. In the event new station monumentation is required to perform the work, new stations shall be monumented in accordance with EM 1110-1-1002 criteria, and an equitable adjustment will be made to the contract.

1.8 DEPTH MEASUREMENT PROCEDURES AND CALIBRATION

1.8.1 Depth Measurement Precision and Accuracy

Depth measurements, including depth observation precision and resolution, shall meet the vertical accuracy requirements for dredging as prescribed in EM 1110-2-1003.

1.9 VERTICAL REFERENCE DATUMS

Depth measurements shall be reduced to the specified datum using concurrent staff/gage readings, as described in EM 1110-2-1003. Tide staffs/gages shall be constructed, referenced, maintained, stilled, and read in accordance with the criteria in EM 1110-2-1003.

1.10 FIELD DATA RECORDING, REDUCTIONS, ARCHIVING, AND PLOTTING REQUIREMENTS.

The data format fields for submitting reduced hydrographic data to the District is x y z. The topographic and feature data shall conform to the intergraph general 3D design file formats specified in the reference.

Digital data shall be contained on a 3.5 inch floppy disk or CD-ROM.

1.11 VOLUME COMPUTATIONS

The Contractor shall have the capability to compute excavation quantities from work performed under this contract. The Government will furnish construction templates and limits from which volumes are to be computed using any of the techniques given in EM 1110-2-1003. Section drawings shall be made at the horizontal and vertical scales given in EM 1110-2-1003.

1.12 MISCELLANEOUS QUALITY CONTROL PROCEDURES

1.12.1 Automated System Synchronization Checks

Each automated hydrographic survey system shall be checked to insure adequacy of correlation between position and depth. Methods for performing this check are given in EM 1110-2-1003.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CONTRACTOR SURVEYS

3.1.1 Survey Personnel

3.1.2 Contractor Quality Control Surveys

The Contractor shall examine his work by conducting hydrographic surveys at no more than 30-day intervals, upon completion of separable portions of the work, and upon completion of the entire work. Contractor quality control surveys shall also be performed and submitted to the Contracting Officer prior to any request for a Government survey for final acceptance. The Contractor shall prepare survey maps based on the results of these surveys.

These maps shall be used, by the Contractor, to satisfy himself of the effectiveness of his operations. Attainment of contract depth shall be verified, and a comparison of actual progress and in-place quantities dredged with scheduled progress shall be performed. Contractor surveys will not be used for final payment or acceptance. See Section 02325 DREDGING for additional Contractor survey requirements.

3.1.3 Contractor Progress Payment Surveys

The Contractor shall conduct surveys for any periods for which progress payments are requested. The Contractor will make the computations based on these surveys. All surveys accomplished by the Contractor shall be conducted under the direction of the Contracting Officer, unless the Contracting Officer waives this requirement for each specific instance. Promptly upon completing a survey, the Contractor shall furnish the all data relating to the survey to the Contracting Officer, who will use the data as necessary to determine the amount of progress payments.

3.2 GOVERNMENT SURVEYS

3.2.1 Government Quantity Surveys

The Contracting Officer will conduct the original and final surveys for all dredging areas and make all quantity computations based on those surveys. The surveys will be performed at no expense to the Contractor, except as

noted in paragraph "Final Examination and Acceptance" below and as specified in Section 02325 DREDGING. The Contractor shall give a minimum of 3 days notice before completion of a portion of the work requiring a post-dredge survey. A minimum of 2 days will be required by the Government for completion of each of the post-dredge surveys at the site and another 10 to 15 days for calculation of quantities removed and verification of completion of work.

All quantity estimates for dredged material removed will be determined using either single beam or multi-beam survey technology. If single beam technology is used, all edited sounding information obtained from Government pre and post dredge surveys will be used in determining the payable quantity of dredged material removed. If multi-beam survey technology is used, then a 3-foot by 3-foot matrix using the sounding closest to cell center (shot depth) will be generated from the edited multi-beam data and used in determining the payable quantity of dredged material removed. A Digital Terrain Model (DTM) will be created from each of the pre and post dredge surveys. A channel design template will be created at the required dredging depth and at the total allowable overdepth. Each of the channel design templates will be compared with the pre dredge DTM to determine the available quantity of required dredge material and available quantity of overdepth material. The same channel design templates will be compared to the post dredge DTM to determine the quantity of material remaining above the required dredging depth and the quantity of material remaining above the total allowable overdepth. The quantity of required dredged material removed will be derived from these comparisons. In all cases, the same channel design templates will be used to determine both the pre and post dredge quantities. Material removed below the total allowable overdepth will not be included in the payable quantity of material.

3.2.2 Final Examination by the Government

a. Submission of all Contractor quality control survey data, including plots, is required prior to performance of final examination and acceptance surveys by the Government.

b. As soon as practicable after completion of the entire work or any section thereof such work will be thoroughly examined at the expense of the Government by sounding or sweeping, or both, as determined by the Contracting Officer. Should any shoals, lumps, or other lack of contract depth be disclosed by this examination the Contractor will be required to remove the shoals by dredging at the contract rate for dredging. If the bottom is soft and the shoal areas are small and form no material obstruction to navigation, the removal of such shoal may be waived at the discretion of the Contracting Officer. Dragging the bottom to remove lack of contract depth will not be permitted. The Contractor will be notified when soundings and/or sweepings are to be made, and may be permitted to accompany the survey party if approved by the Contracting Officer. When the area is found to be in a satisfactory condition, it will be accepted finally. Should more than one sounding or sweeping operation by the Government over an area be necessary by reason of work for removal of shoals disclosed by a prior sounding or sweeping, the cost of such second and any subsequent sounding or sweeping operations will be charged against the Contractor. The rate for each day in which the Government survey plant is engaged in such sounding or sweeping operations and/or is en route to or from the site, or is held, for the Contractor's convenience at or near the site for these operations, shall be \$2,040.00.

3.2.3 Final Acceptance by the Government

Final acceptance of the whole or any part of the work, and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error.

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SECTION 02111

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SECTION 02111

HANDLING AND TRANSPORTATION OF CONTAMINATED MATERIAL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

STATE OF NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

Env-Wm 513 (2000) Hazardous Waste Rules, as amended

Env-Wm 608 (2001) Hazardous Waste Rules, as amended

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 262 Standards Applicable to Generators of Hazardous Waste

40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 302 Designation, Reportable Quantities, and Notification

49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

49 CFR 173 Shippers - General Requirements for Shipments and Packagings

1.2 REGULATORY REQUIREMENTS - AIR EMISSIONS

Air emissions shall be monitored and controlled in accordance with Federal, State, and local rules and regulations.

1.3 DESCRIPTION OF WORK

The work covered by this section of the specifications involves the unloading of contaminated dredged material from scows, the placement of this material in trucks at the off-load site, and the transportation of this material to the disposal site. Contaminated dredged material from scows shall not be stored at the off-load site.

PART 2 PRODUCTS

2.1 SPILL RESPONSE MATERIALS

The Contractor shall provide spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported.

Spill response materials shall be compatible with the type of materials and contaminants being handled.

PART 3 EXECUTION

3.1 EXISTING STRUCTURES AND UTILITIES

No excavation shall be performed until site utilities have been field located. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost to the Government. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without written approval from the Contracting Officer. In addition, the contract drawings indicate a "no spud zone".

3.2 CONTAMINATED MATERIAL OFF-LOAD AREA

The following paragraphs describe acceptable methods of constructing the material off-load area. The off-load area shall be constructed of materials that are compatible with the material or liquid to be handled.

3.2.1 Staging Pad

The staging pad shall be designed to withstand operation of material handling equipment and to prevent infiltration of contact water. The slope of the surface of the staging pad shall be not less than 2 percent. Water collection channels shall be incorporated into the staging pad, and the pad shall drain, by gravity, to collection sumps which will pump to liquid storage units. Sloping, placement of collection channels, and sump shall be sufficient to prevent ponding in the staging pad area.

a. A geomembrane liner with a minimum thickness of 40 mils shall be used. The liner shall be protected from vehicles by a 16 ounce/square yard geotextile and a traffic surface layer consisting of washed stone or other material which will not damage the geomembrane. The ground surface on which the geomembrane is placed shall be smooth and free of rocks greater than 0.5 inches in diameter or any other object that could damage the geomembrane.

b. The liner shall be sloped to a low point to allow leachate to be collected. Leachate collected from the staging pad shall be collected per subpart "Liquid Storage", and transported to the leachate collection system of the Confined Dredge Disposal Area.

c. Berms surrounding the staging pad shall be a minimum of 12 inches in height.

d. Overspray shall be contained using curtains or barriers.

3.2.2 Storage of Liquid from the Staging Pad

Liquid collected from the staging pad shall be temporarily stored in tanks appropriate for the volume being collected. Liquid storage containers shall be water-tight and shall be located as agreed to by the Contractor and the Contracting Officer.

3.3 SAMPLING

3.3.1 Sampling at the Off-Load Area

Samples from beneath and three feet outside of the off-load area shall be collected prior to construction of and after removal of the staging pad. Samples shall be collected at a frequency of one per each 500 square feet (SF) from a depth interval of 0 to 0.5 feet. Samples shall be tested for semivolatile organics, volatile organics, polychlorinated biphenyls, pesticides and RCRA 8 metals. Based on test results, soil which has become contaminated above action levels shall be removed at no additional cost to the Government. Contaminated material which is removed from beneath the staging pad shall be sampled as above, one sample per each 500 SF from the top six inches of the excavation floor and one sample from each sidewall. As directed by the Contracting Officer, additional sampling and testing shall be performed to verify spills have been cleaned up.

3.4 SPILLS

In the event of a spill (e.g., accidental discharge of dredged material from the bucket) or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the Contracting Officer immediately. If the spill or discharge/leak exceeds reporting thresholds as specified in 40 CFR 302, Env-Wm 513, and Env-Wm 608, the Contractor shall develop procedures for immediate reporting and containment. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the Contracting Officer, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Government.

3.4.1 Emergency Contacts

The Contractor shall designate an emergency coordinator and post the following information at areas in which waste materials are managed:

- a. The name of the emergency coordinator.
- b. Phone number through which the emergency coordinator can be contacted on a 24-hour basis.
- c. The telephone number of the local emergency responders (police, fire, ambulance, hospital).
- d. Map with directions identifying the route to the hospital.
- e. The location of fire extinguishers, first aid kits, and spill control materials.

3.5 CONTAMINATED MATERIAL STORAGE

The following subparts describe acceptable methods for contaminated material storage and transportation vehicles. Storage units and transportation vehicles shall be in good condition and constructed of materials that are compatible with the materials or liquids to be stored.

3.5.1 Liquid Storage

Liquid collected from the staging pads and dredge temporary storage containers shall be temporarily stored in tanks. Liquid storage containers shall be water tight and shall be located adjacent to the storage pad. This water shall be transported to the disposal site by vacuum trucks.

3.6 TRANSPORTATION OF MATERIALS TO THE DISPOSAL SITE

3.6.1 Contaminated Materials Packaging

The contractor shall provide bulk containers for packaging and transporting of waste materials to the disposal area consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 8, or appropriate state or local regulations. Bulk packaging shall meet the corresponding specifications in 49 CFR 173 referenced in the Hazardous Material Table, 49 CFR 172, Section .101. Each packaging shall conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of special provisions of column 7 of the Hazardous Materials Table in 49 CFR 172, Section .101 and shall be compatible with the material to be packaged as required by 40 CFR 262. The Contractor shall also provide other packaging related materials such as materials to fill voids or absorb excess liquids. Sorbent materials shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the hazardous materials being packaged. Additionally, sorbents used to treat free liquids to be transported to the disposal area shall be non-biodegradable as specified in 40 CFR 264, Section .314.

3.6.2 Dump Trucks/Roll-Off Units

Dump trucks/roll-off units used to temporarily store/transport contaminated material to the disposal site shall be water tight. A cover shall be placed over the units/truck beds to prevent precipitation from contacting the stored materials. Excess liquids shall be removed and temporarily collected per Subpart "Liquid Storage". Sorbent materials required to treat free liquids shall do so as designated in Subpart "Contaminated Materials Packaging".

3.6.3 Transportation

Prior to transportation of contaminated materials to the disposal site, the exterior truck body shall be free of any contaminated materials. Waste materials shall be secured with the truck and tarped prior to transport. The tailgate of each truck shall be inspected to ensure that waste materials are not leaking. If necessary, sorbent materials shall be added as specified in Subpart "Contaminated Materials Packaging". After off-loading of waste materials at the disposal area, tires and tailgates of the trucks shall be cleaned prior to leaving the disposal area.

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SECTION 02325

DREDGING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety and Health Requirements
Manual

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.2.1 Environmental Protection Requirements

Provide and maintain during the life of the contract environmental protective measures. Also, provide environmental protective measures required to correct conditions, such as oil spills or debris, that occur during the dredging operations. Comply with Federal, State, and local regulations pertaining to water, air, and noise pollution. See Section 01355 ENVIRONMENTAL PROTECTION.

1.2.2 Underwater Diving Operations

In the event that underwater diving operations become necessary due to the work of this contract, such operations shall be conducted in accordance with EM 385-1-1, Section 30.

1.3 DEFINITIONS

1.3.1 Maintenance Material

Maintenance material is defined as the sediments that have accumulated within the Cocheco River Federal Navigation Channel since completion of the last maintenance dredging in 1906. Materials to be encountered are anticipated to be sand and silt with cobbles and boulders. Maintenance material also includes accumulated sediment material that sloughs off the banks when dredging adjacent to piers in berth areas, and accumulated sediment material that sloughs off the Federal Navigation Channel side slopes. The Contractor may encounter ledge below the required depth but within the over-depth prism, which may slow the dredging process. This situation will not be considered a changed site condition and will not be grounds for modifications to the contract or claims.

1.3.2 Bedrock

The removal of bedrock from the Federal Channel at the locations shown on the contract drawings is required.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Plan; G, RO.

The Contractor shall submit a work plan for accomplishing the dredging work of this contract. The following items shall be considered, at a minimum, for inclusion in the work plan:

- a. Anticipated plant and equipment,
- b. proposed means and methods for removal of derelict moorings if encountered,
- c. expected coordination requirements,
- d. survey requirements,
- e. proposed measures for avoiding damage to adjacent structures and banks of the river,
- f. proposed measures to avoid overdredging, and
- g. procedures for offloading dredged material from scows
- h. procedures for the handling of excess water from the scows
- i. plans for development of the off-load area and staging pad (see Section 02111 HANDLING AND TRANSPORTATION OF CONTAMINATED MATERIAL for detailed requirements).
- j. procedures for avoiding resuspension of dredged material in the water column.

Debris Management Plan.

A debris management plan shall be developed as specified in this section and submitted to the Contracting Officer for review.

Scow Cards.

Submit scow cards for each scow to be used for contract work. Scow cards shall have information specified in paragraph "Scows."

SD-05 Design Data

Equipment and Performance Data.

The Contractor shall furnish proof of electronic positioning equipment calibration to the Contracting Officer.

Daily/Monthly Report of Operations.

The Contractor shall prepare and submit two (2) copies of the Daily Report of Operations, using ENG Form No. 4267, for each dredge. This report shall be submitted on a daily basis. A copy of this form is appended to the end of Section 01451 CONTRACTOR QUALITY CONTROL. In addition to the daily report, the Contractor shall prepare a Monthly Report of Operations for each month or partial month's work on ENG Form No. 4267. The monthly report

shall be submitted to the Contracting Officer on or before the 7th of each month, consolidating the previous month's work. Upon completion of the project, the Contractor shall submit a consolidated project report, combining the monthly reports.

Additionally, one copy of the reports shall be maintained by the Contractor on the dredge(s) for the Contracting Officer's inspection purpose. Further instructions on the preparation of the reports will be furnished at the Preconstruction Conference.

1.5 NOTIFICATIONS

1.5.1 Notice of Misplaced Material

The Contractor shall notify the Contracting Officer and the U.S. Coast Guard Marine Safety Office of any misplaced material.

1.5.2 Notice of Need for Dredging Survey

The Contractor shall give advance notice to the Contracting Officer of the need for an after-dredging survey for final acceptance for each acceptance section. See Section 01723 FIELD ENGINEERING FOR DREDGING, Subpart GOVERNMENT SURVEYS.

1.6 Relocation of Navigation Aids

The Contractor shall not remove, change the location of, obstruct, willfully damage, make fast to, or interfere with any aid to navigation. The Contractor shall notify the Coast Guard District Commander, in writing, with a copy to the Contracting Officer, 30 days in advance of the time he plans to dredge adjacent to any aids which require relocation to facilitate the dredging operation. A copy of the notification shall be provided to the Contracting Officer.

1.7 MATERIAL TO BE REMOVED

1.7.1 Character of Materials to be Removed

Material to be dredged is known to be contaminated with PAH's, TPH, and the metals chromium, lead, mercury, and antimony.

Samples have been taken by the Government to determine the character of materials to be removed. Although the results of such explorations are representative of subsurface conditions at their respective locations, local minor variations in the subsurface materials are to be expected and, if encountered, will not be considered materially different within the purview of the contract. A map of the locations where samples were taken and the results of testing on the samples are attached to Section 00320 GEOTECHNICAL DATA. The material to be removed to accomplish the specified dredging work is anticipated to be sand and silt with cobbles and boulders. The Contractor is expected to examine the site of the work and decide the character of the material for himself.

1.7.2 Existing Environmental Assessment Report

An Environmental Assessment (EA) was performed for the dredging of the Cocheco River Federal Navigation Channel. The Sampling and Laboratory Testing Report portion of the EA is attached at the end of this Section. A copy of the full EA is available at NAE for the Contractor's use.

1.7.3 Bedrock

The Contractor is strongly encouraged to visit the site to observe the nature of the bedrock along the river channel. Bedrock outcrops along the river channel can be best viewed by boat at low water. Rock removed during the first phase of dredging can be observed by visiting the rock spoil pile at the north end of the disposal cell. The Contractor shall coordinate visits to the disposal cell with the town of Dover, NH. Contact information is provided below:

Mr. Dean Peschel
Environmental Projects Manager
City of Dover, NH
Telephone: 603-516-6094

Bedrock types exposed along the river channel through the Upper and Lower Narrows generally consist of very hard crystalline metamorphic and igneous rocks, including but not limited to: quartzite, granite, gneiss, and quartz-mica schist. The structure of the metamorphic rock ranges from steeply sloping to horizontally layered. There are several fracture sets. One set of fractures is parallel to the rock structure, and the others cut across the structure. The igneous rock (granite) has also been metamorphosed slightly, but has an overall more massive appearance, and more random fracture pattern.

Rock encountered within the channel during the first phase of dredging was not rippable with a clamshell bucket. Rock removal will likely require percussive methods to break up the rock (i.e., hoe ram). In the area where the structure of the rock is horizontally layered, drilling and blasting may be more efficient.

1.8 WORK AREA

1.8.1 Access

The Contractor shall be responsible for providing and maintaining access necessary for his equipment and plant to and from the work site, mooring area, and off-load area. The Contractor shall ascertain the environmental conditions which can affect the access such as climate, winds, currents, waves, depths, shoaling, and scouring tendencies.

1.8.2 Protection of Existing Waterways

The Contractor shall conduct his operations in such a manner that material or other debris are not pushed outside of dredging limits or otherwise deposited in existing side channels, basins, docking areas, or other areas being utilized by vessels. The Contractor will be required to change his method of operations as may be required to comply with the above requirements. Should any bottom material or other debris be pushed into areas described above as a result of the Contractor's operations, the material must be promptly removed.

1.8.3 Adjacent Property and Structures

The Contractor shall conduct the dredging operation such that it does not undermine, weaken or otherwise impair existing structures located in or near the areas to be dredged. The Contractor shall investigate the existing structures at the site and plan the dredging work accordingly.

Damage to private or public property or structures resulting from the disposal or dredging operations shall be repaired promptly by the Contractor at his expense. Damage to structures resulting from the Contractor's negligence will result in suspension of dredging and require prompt repair at the Contractor's expense as a prerequisite to the resumption of dredging.

1.8.4 Artificial Obstructions

The Government has no knowledge of cables, pipes, or other artificial obstructions, or of any wrecks, wreckage, or other material that would necessitate the employment of additional equipment for economical removal. If actual conditions differ from those stated or shown, or both, an adjustment in contract price or time for completion, or both, will be made in accordance with "FAR 52.236-2, Differing Site Conditions."

1.8.5 Existing Utilities

1.8.5.1 Utility Contacts

The Federal Navigation Channel to be dredged is crossed by one underground natural gas pipeline and several overhead electrical and communication lines. These crossings are shown on the contract drawings. The following tabulation of utility contacts is provided for the convenience of the Contractor:

- a. Electrical: PSNH; Jim Osburn at 603-332-4227, extension 5342.
- b. Communication: Verizon; Bob Sawyer at 603-743-1118.
- c. Natural Gas: Northern Utilities; Curt Burrill at 1-800-524-4486, extension 5337. Northern Utilities shall be contacted 30 days prior to the start of dredging work at the site.

1.8.5.2 Protection of Utility Lines

Existing utility lines that are shown on the drawings or the locations of which are made known to the Contractor prior to dredging, and that are to be retained, shall be protected from damage during dredging, and if damaged, shall be satisfactorily repaired by the Contractor at no additional cost to the Government. Prior to commencement of dredging, the Contractor shall coordinate with the Contracting Officer and the applicable utility company to mark the exact locations of existing utilities, and establish in detail the proposed method of protecting the existing utilities. In the event that the Contractor damages any existing utility lines that are not shown on the drawings or the locations of which are not known to the Contractor, report thereof shall be made immediately to the Contracting Officer. If the Contracting Officer determines that repairs shall be made by the Contractor, such repairs will be ordered under the Contract Clause entitled "DIFFERING SITE CONDITIONS."

1.9 QUANTITY OF MATERIAL

The total estimated amount of material to be removed from within the specified limits, including side slopes and allowable overdepths is shown on the Bidding schedule. The estimated quantity for bidding purposes and for application of the "FAR 52.212-11, Variation in Estimated Quantity" shall be the total quantity, including overdepth. The quantities listed

are estimates only.

1.10 OVERDEPTH AND SIDE SLOPES

1.10.1 Allowable Overdepth

To cover unavoidable inaccuracies of dredging processes, material removed to the overdepth shown on the drawings and within the dredging limits will be measured and paid for at full contract price.

1.10.2 Side Slopes

Material dredged to provide for final indicated side slopes will be measured and paid for at the applicable unit price. Payment will not be made for material in excess of the amount originally lying above the pay slope plane. The limiting amount of side-slope overdepth will be measured vertically.

1.10.3 Excessive Dredging

Material taken from beyond the limits as extended in the Article "OVERDEPTH AND SIDE SLOPES" above will be deducted from the total amount dredged as excessive overdepth dredging, or excessive side-slope dredging for which payment will not be made, and for which liquidated damages may be applied.

1.11 INSPECTION

Inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. See Section 01451 CONTRACTOR QUALITY CONTROL.

1.11.1 Method of Communication

Provide a system of communication between the dredge crew, the scows, and the Contracting Officer. Portable two-way marine radios are acceptable.

1.11.2 Transportation

The Contractor shall furnish, at the request of the Government Representative, the use of such boats, boatmen, laborers, and material forming a part of the ordinary and usual equipment and crew of the equipment or marine plant as may be reasonably necessary in inspecting and monitoring the work. The Contractor shall furnish, on the request of the Government Representative, suitable transportation from all points on shore designated by the Contracting Officer to and from the various pieces of plant and the work site.

1.12 MOORINGS AND FLOATS

1.12.1 Active Moorings and Floats

The City of Dover, NH will be responsible for the removal and replacement of active moorings and floats at no cost to the Contractor. The moorings and floats will be removed by the City prior to the commencement of dredging operations. Moorings and floats removed by the City will not be replaced until the completion of the project. The Contractor shall coordinate and confirm the time schedule necessary for the removal of the moorings and floats with City of Dover.

1.12.1.1 Derelict Moorings

Derelict moorings located by the Contractor during dredging operations, or otherwise made known to the Contractor, shall be reported to the Contracting Officer. The Contracting Officer will verify the location of the moorings and any potential hazards to navigation. Such moorings shall be removed and disposed by the Contractor at no additional cost to the Government.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 CONDUCT OF DREDGING WORK

3.1.1 Order of Work

The Contractor shall complete the dredging work in the following order:

1. Blasting for rock removal, if required, shall be performed in the time period specified in Section 02328 UNDERWATER DRILLING AND BLASTING, and not necessarily in sequence with other dredging work, or with rock removal using methods other than blasting.

2. Dredging of Federal Navigation Channel, beginning at the head of navigation (upstream limit) and proceeding downstream.

Note 1: The Order of Work is further subject to the exercise of options.

The Contractor shall prepare and submit to the Contracting Officer for review and approval a progress schedule in accordance with Section 01110 SUMMARY OF WORK, Subpart "Work Sequence". The Contractor shall start and complete the work in the order of precedence as shown above and as shown on the progress schedule approved by the Contracting Officer. The Government reserves the right to change the order of work at any time.

3.1.2 Method of Dredging - Mechanical

All dredging under this contract shall be performed using the mechanical type of dredge and scows. The Contractor shall use a closed bucket for dredging and shall not allow overflow of dredge water from scows into the river. Dredged material shall be transported in scows to the off-load location shown on the contract drawings. The Contractor is responsible for developing the scow off-load site which is just beyond the upstream limit of the Federal Navigation Channel.

3.1.3 Method of Offload and Disposal - Mechanical

Disposal shall be in an upland lined dredged material disposal area owned and operated by the City of Dover, New Hampshire. The land haul distance from the off-load location to the disposal facility is approximately 1/4 mile. Dredge water shall be pumped from the scows at the off-load location into tank trucks, hauled to the disposal area, and pumped out of the trucks into the disposal area without spillage. Dredge material shall be removed from the scows at the off-load location, hauled to the disposal area in leak-proof dump trucks, and off-loaded into the disposal area without spillage. The Contractor shall coordinate disposal of dredged material at

the upland disposal site with the City of Dover. The Contractor shall follow all City of Dover rules and regulations regarding use of the disposal site.

3.1.4 Misplaced Material Disposal

Material that is deposited elsewhere than in locations designated or approved by the Contracting Officer will not be paid for and the Contractor shall be required to remove such misplaced material and deposit it where directed at his expense.

3.1.5 Interference with Navigation

Minimize interference with the use of channels and passages. The Contracting Officer will direct the shifting or moving of dredges or the interruption of dredging operations to accommodate the movement of vessels and floating equipment, if necessary. The Contractor shall comply with all requests from the Contracting Officer to move or interrupt dredging operations for a reasonable time period at no additional cost to the Government.

3.1.6 Ranges, Gages, and Lines

Furnish, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend dredging when the gages or ranges cannot be seen or followed. The Contracting Officer will furnish, upon request by the Contractor, survey lines, points, and elevations necessary for the setting of ranges, gages, and buoys.

3.1.7 Debris Management

Debris removed from the bottom during dredging operations, which is not suitable for disposal at the land disposal site, shall be collected and removed from the site. Unsuitable materials include large items such as timbers, pilings, sections of piers, and metallic debris. A debris management plan shall be developed, reviewed by the Contracting Officer and followed by the Contractor. Each day during dredging operations, the Contractor shall use a boat to collect and remove floating debris resulting from project activities. Floating debris shall also be removed from within scows or barges. Containers for temporary storage of the collected debris shall be maintained on the dredge or support barge.

3.1.8 Lights

Each night, between sunset and sunrise and during periods of restricted visibility, provide lights for floating plants, pipelines, ranges, and markers. Also, provide lights for buoys that could endanger or obstruct navigation. When night work is in progress, maintain lights from sunset to sunrise for the observation of dredging operations. Lighting shall conform to United States Coast Guard requirements for visibility and color.

3.2 PLANT

3.2.1 Tow Boats

All tow boats used for towing to the off-load location shall be equipped with DGPS navigational equipment, radar, corrected compass, marine radio,

and depth sounding equipment which is to be maintained in operating condition during each tow. The tow boats utilized by the Contractor for this purpose shall be of a size adequate for towing, and shall have necessary reserve power for maneuvering with scows and for maneuvering under emergency conditions, as well as for control of scows at the off-load area.

3.2.2 Scows

The Contractor shall provide and maintain markings on all scows clearly indicating the draft of the scow and shall provide scow cards for each scow used on the contract work. The scow cards shall show dimensions and volumes of individual pockets of scows and total volumes for varying depths below coaming or top of pockets. This is to enable Government personnel to make a determination of scow volume and corresponding drafts under partial and full load conditions. These measurements are to be made at the time of initial use of each scow. This information will then be furnished to disposal inspectors to enable them to estimate scow volume from draft of scows for each scow being towed to the disposal area. The scow volume estimates are for use in connection with disposal area monitoring studies and are not intended to be used in determining quantities dredged. At the beginning of the work and as additional scows arrive on the project, sufficient time shall be allowed by the Contractor and assistance of Contractor personnel shall be made available by the Contractor for the purpose of obtaining the measurements of each scow under various partial and full load conditions. During the entire period of contract work, the Contractor shall provide and maintain sufficient spot or floodlights to permit the reading of the draft on the sides of scows at bow and stern from the tow boat at night and when visibility is impaired. The draft readings and each pocket/compartment measurement will be required for each scow towed to the disposal area and will be made by the disposal inspector. Measurements are to be taken and recorded prior to departure from the dredge site and upon arrival at the immediate disposal location. The Contractor shall ensure that adequate time is allowed by the tow boat captain for these readings to be obtained.

3.2.2.1 Scow Pocket Doors

Due to the contamination levels of the dredged material, the Contractor shall achieve proper closure and watertightness of pocket doors to eliminate seepage or leakage of material. The use of plastic material to cover cracks in scow pockets will not be allowed.

3.3 SHOALING

If, before the contract is completed, shoaling occurs in any section previously accepted, including shoaling in the finished channel because of the natural lowering of the side slopes, redredging at contract price, within the limits of available funds may be done if agreeable to both the Contractor and the Contracting Officer.

3.4 FINAL CLEANUP

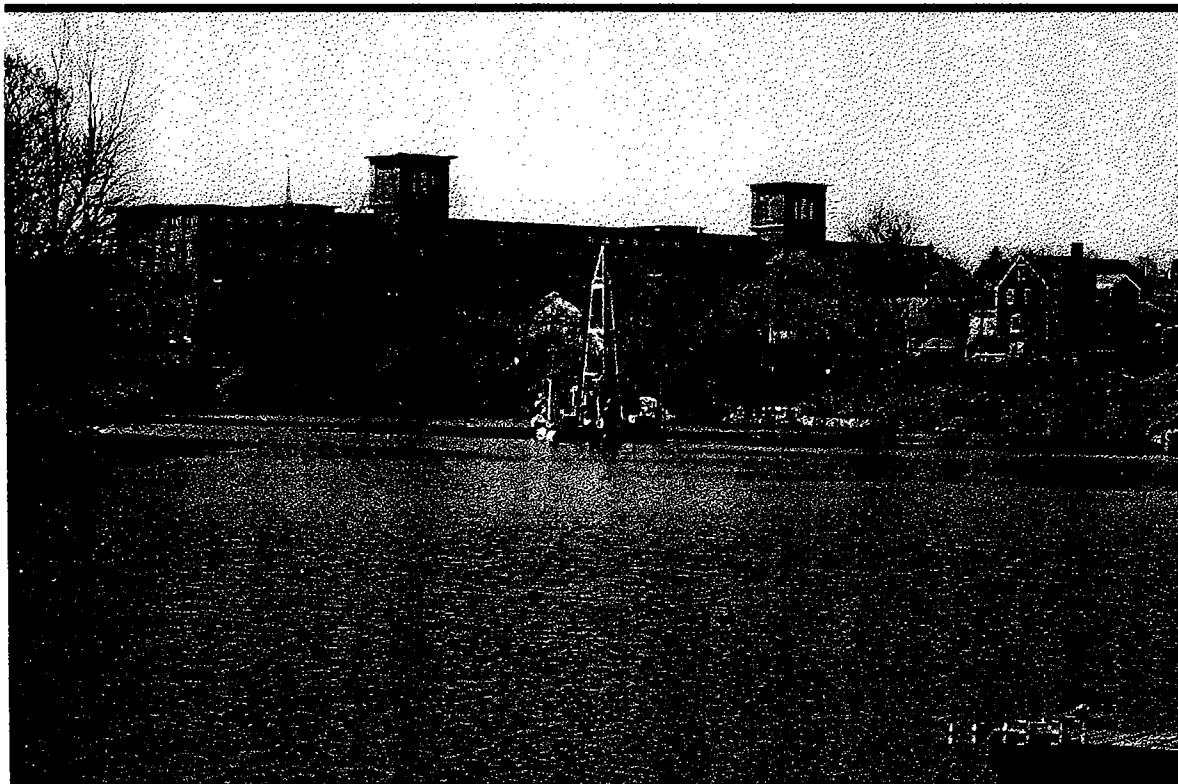
Final cleanup shall include the removal of all the Contractor's plant and equipment either for disposal or reuse. Plant, equipment, and materials to be disposed of shall only be disposed in a manner and at locations approved by the Contracting Officer. Unless otherwise approved by the Contracting Officer, the Contractor will not be permitted to abandon any equipment in the disposal area or other areas adjacent to the worksite.

Failure to promptly remove all plant, equipment, and materials upon completion of the dredging will be considered a delay in the completion of the final cleanup and demobilization work. In such case, the Government will exercise its right to remove any plant, equipment, and materials at the Contractor's expense.

] -- End of Section --

Contract No. DACW33-96-0005
Delivery Order No. 16

March 2, 1998



FINAL REPORT

**Sampling and Laboratory
Testing in Support of
Environmental
Assessment
Cocheco River
Dover, NH**

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ATTACHMENT B	Target Analyte List and Detection Limits
ATTACHMENT C	Chain of Custody Forms
ATTACHMENT D	Sediment Measurements; Grain Size, Atterberg Limits, % Solids, TOC
ATTACHMENT E	TCLP Data – Philip Analytical Data Package
ATTACHMENT F	Ambient Water Chemical Results and QA/QC
ATTACHMENT G	Elutriate Water Chemical Results and QA/QC

1.0 INTRODUCTION

The objective of this project is to provide data to the U.S. Army Corps of Engineers, New England District (NAE) to assess potential environmental effects associated with a proposed maintenance dredging project of the Cocheco River in Dover, New Hampshire.

To accomplish the NAE objective, sediment cores and water were collected from 8 discrete Reaches of the River. Composited sediment and water from each reach were shipped to Soil Technology, Inc. in Bainbridge Island, Washington for preparation of modified elutriate tests (METs). Elutriates and background elutriates (site water processed through the MET process without sediment) were analyzed for a suite of organic and inorganic parameters to determine the impact of dredging on the water column during dredging operations. Ambient site water was collected for analyses from the eight Reaches and from three locations near the disposal site. Aliquots of the composited sediment cores were assessed for a specified list of organic and inorganic parameters using the Toxicity Characteristic Leaching Procedure (TCLP). Bulk sediment was also analyzed for total organic carbon (TOC), Atterberg limits and grain size. All methods conformed to those outlined in the 1994 Inland Testing Manual (USACE 1994), unless otherwise noted.

This report provides the details of the activities that occurred in support of sampling and analyses of sediment water and METs. Supporting information and analytical results are provided in the following attachments:

- Attachment A - Ocean Surveys, Inc. Field Report;
- Attachment B - Target Analyte List and Detection Limits;
- Attachment C - Chain of Custody Forms;
- Attachment D - Sediment Measurements; Grain Size, Atterberg Limits, % Solids, TOC;
- Attachment E - TCLP Data, Philip Analytical Data Package;
- Attachment E - Ambient Water Chemical Results and QA/QC;
- Attachment G - Elutriate Water Chemical Results and QA/QC.

2.0 MATERIALS AND METHODS

2.1 Sample Collection

Field sampling in the Cocheco River was performed by Battelle Duxbury Operations (BDO) and its subcontractor, Ocean Surveys, Inc. (OSI) of Old Saybrook, Connecticut. Table 1 lists the types of samples collected from each sampling location. Note that dissolved measurements were only prepared for waters and elutriate associated with 3 of the 8 reaches. Dissolved measurements were made at the instruction of the USACE Waterways Experiment Station (WES) in Vicksburg, Mississippi, for use in models to determine the relationship between dissolved and particulate associated contaminants. The remaining measurements were made on "Total" samples, which indicates that no filtration or additional settling was performed on these samples prior to chemical analyses. Attachment A contains the field report provided by OSI and includes detailed descriptions of sampling methods and equipment, coordinates for sampling locations and core logs. Figure 1 shows the individual Reach limits in the Cocheco River and Figures 2 through 9 present the sampling locations within each Reach. The following describes the overall sample collection scheme.

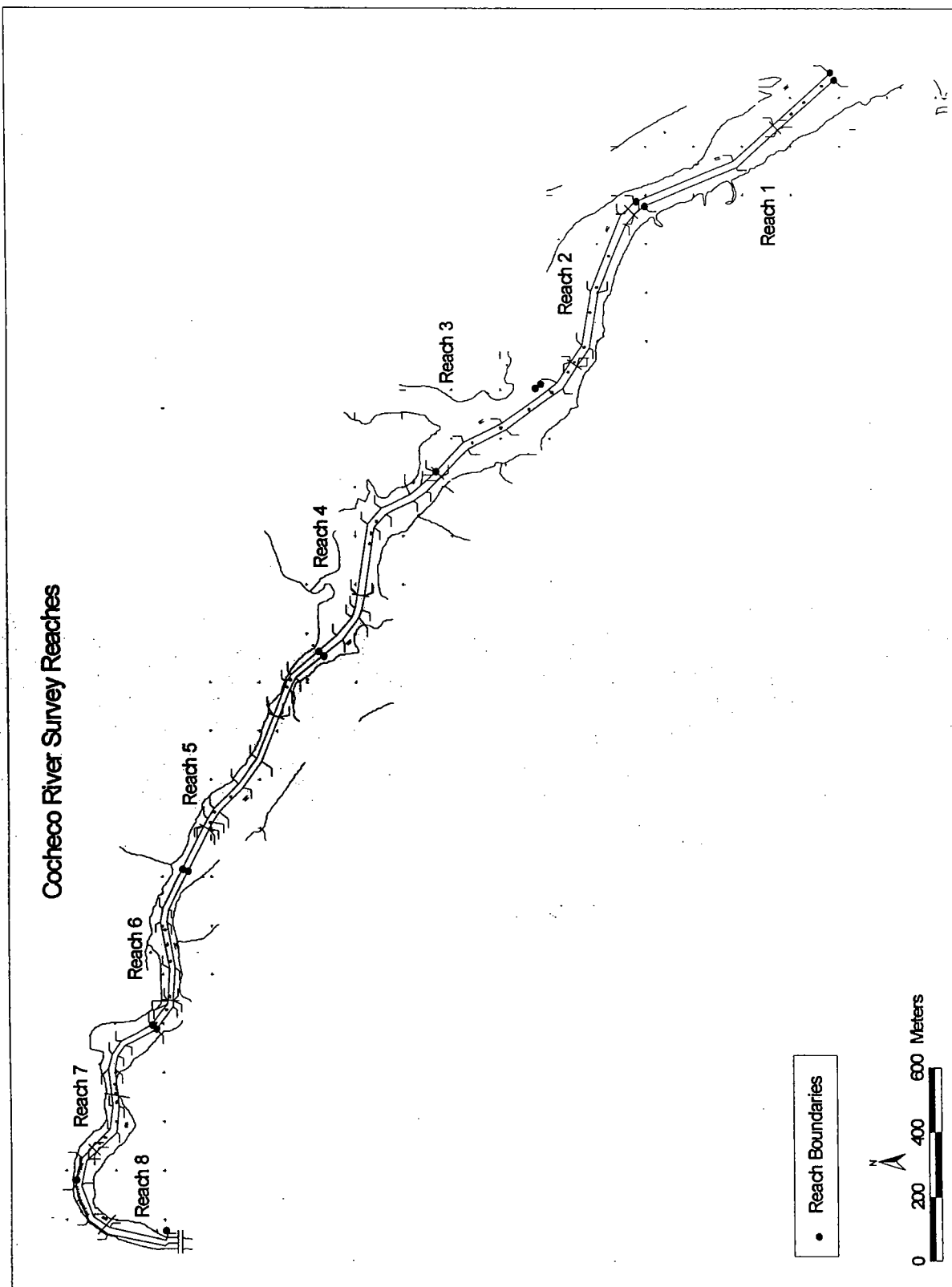


Figure 1. Cocheco River/Sampling Reaches

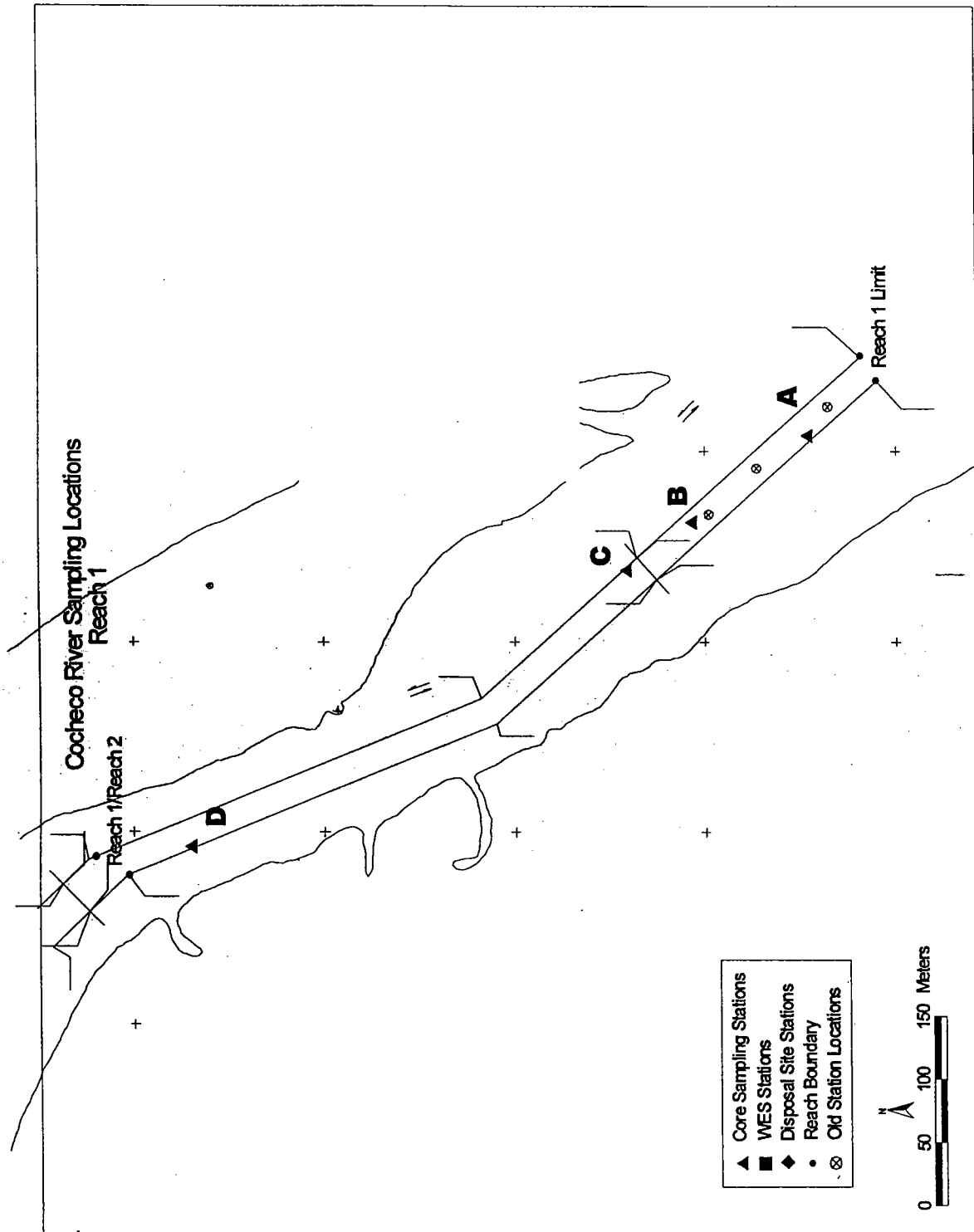


Figure 2. Cochecho River Reach 1

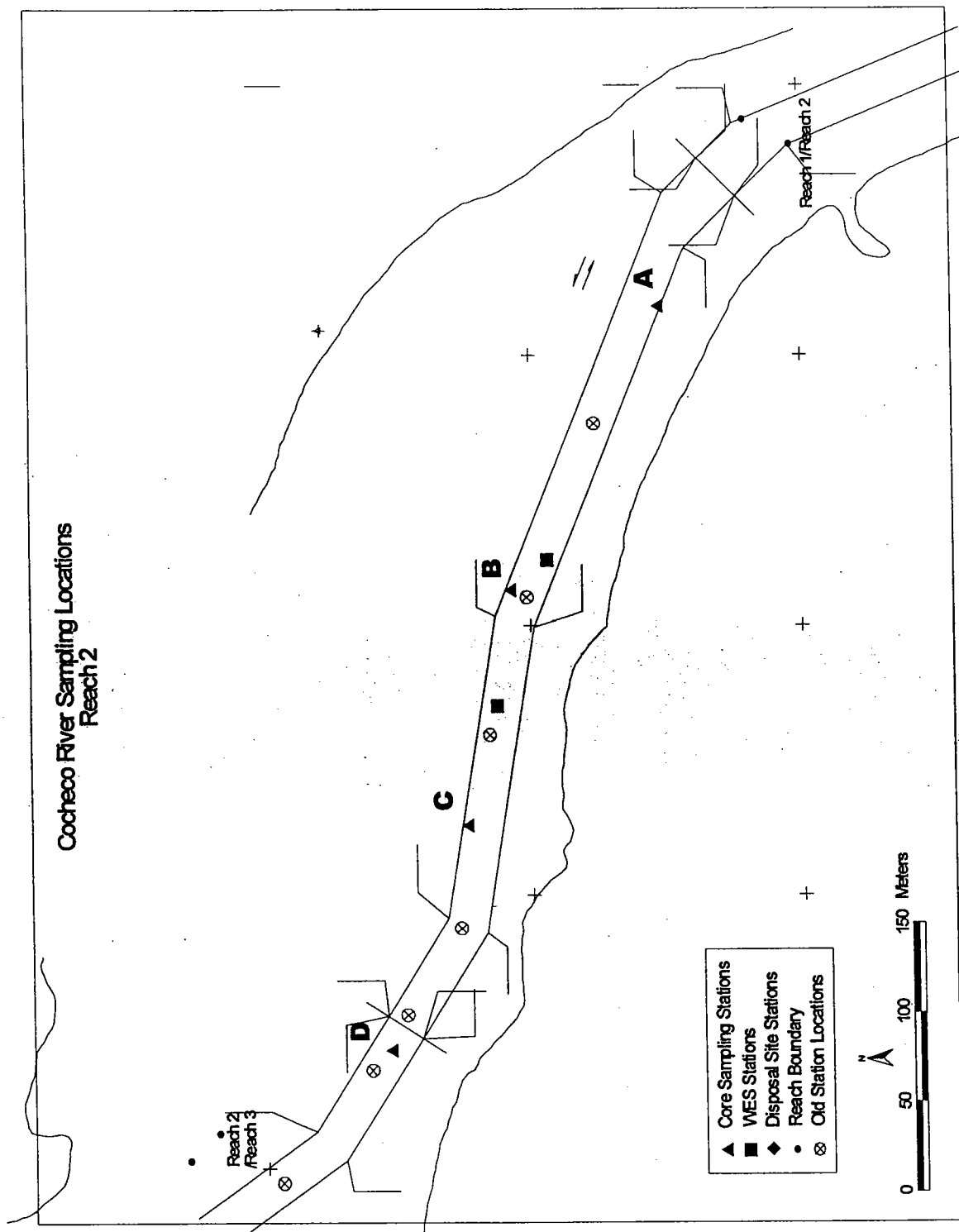


Figure 3. Cochecho River Reach 2

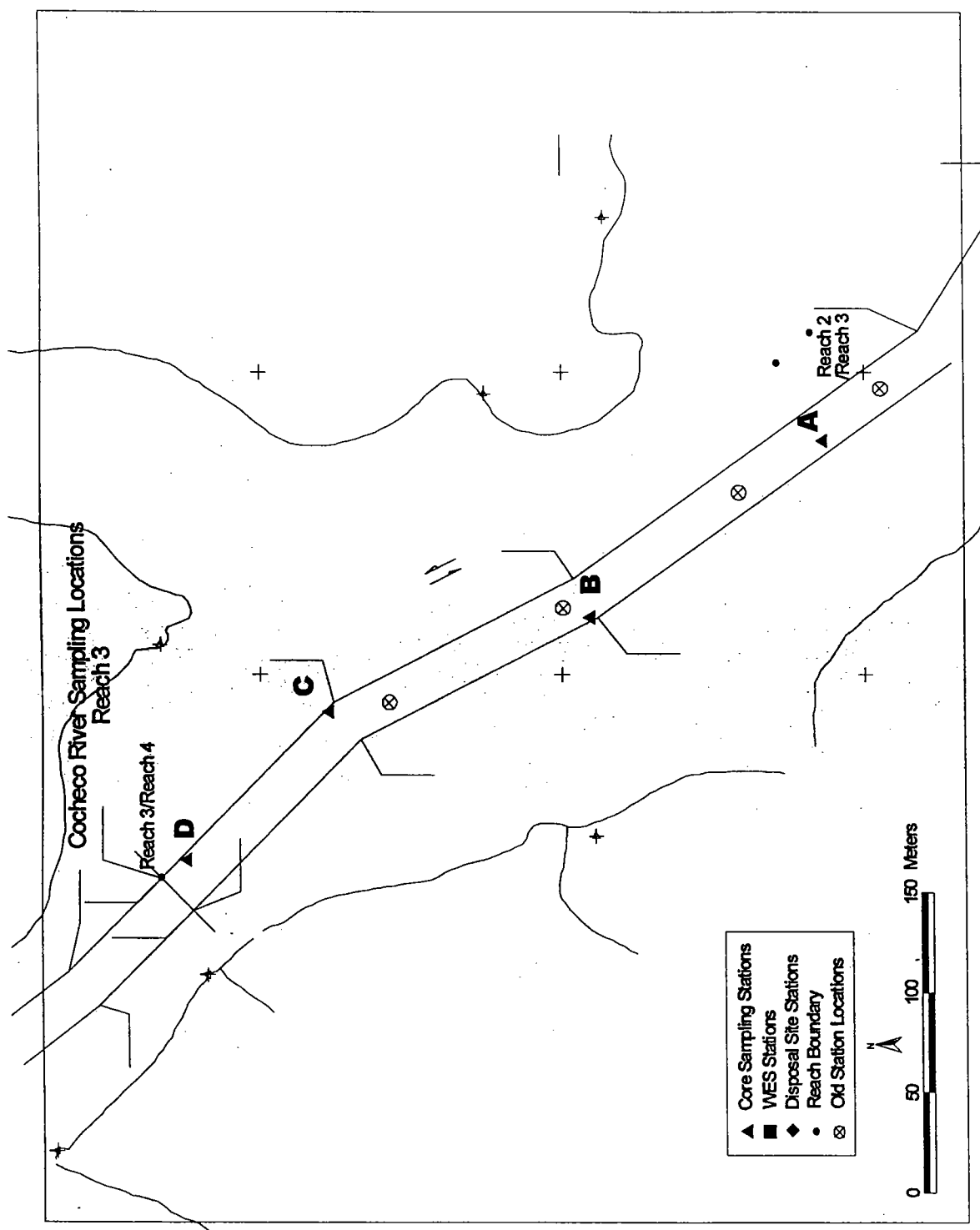


Figure 4. Cocheco River Reach 3

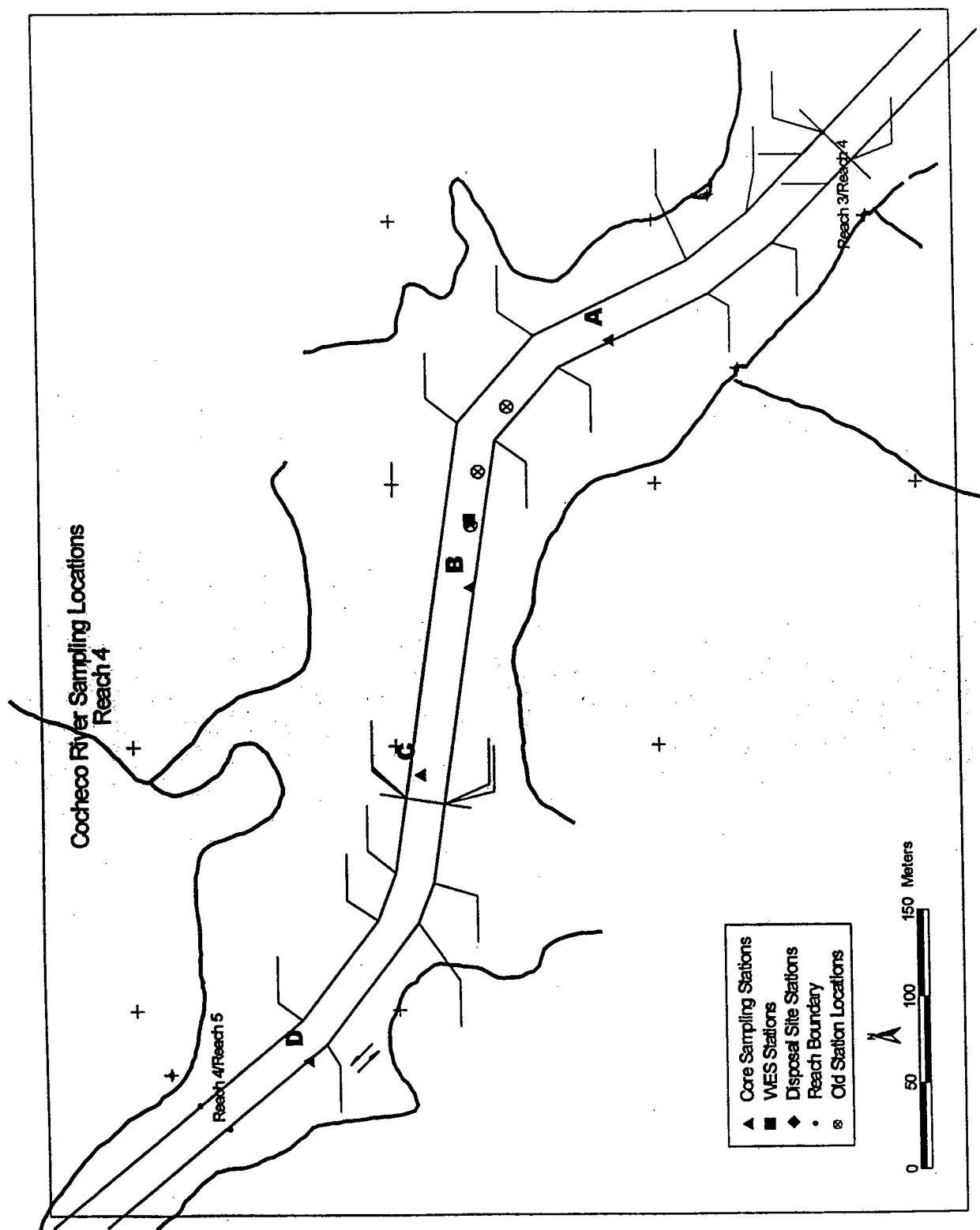


Figure 5. Cocheco River Reach 4

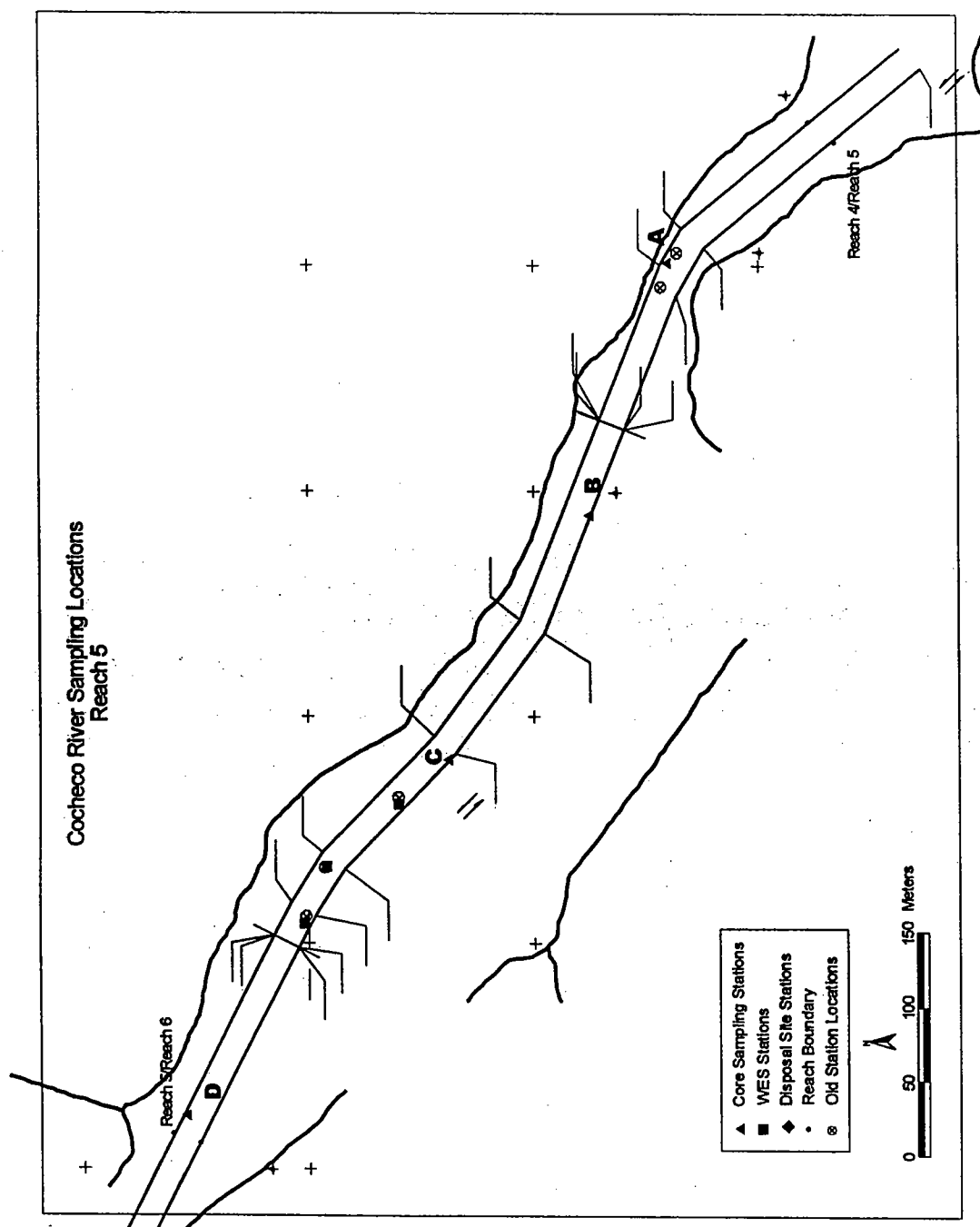


Figure 6. Cocheco River Reach 5

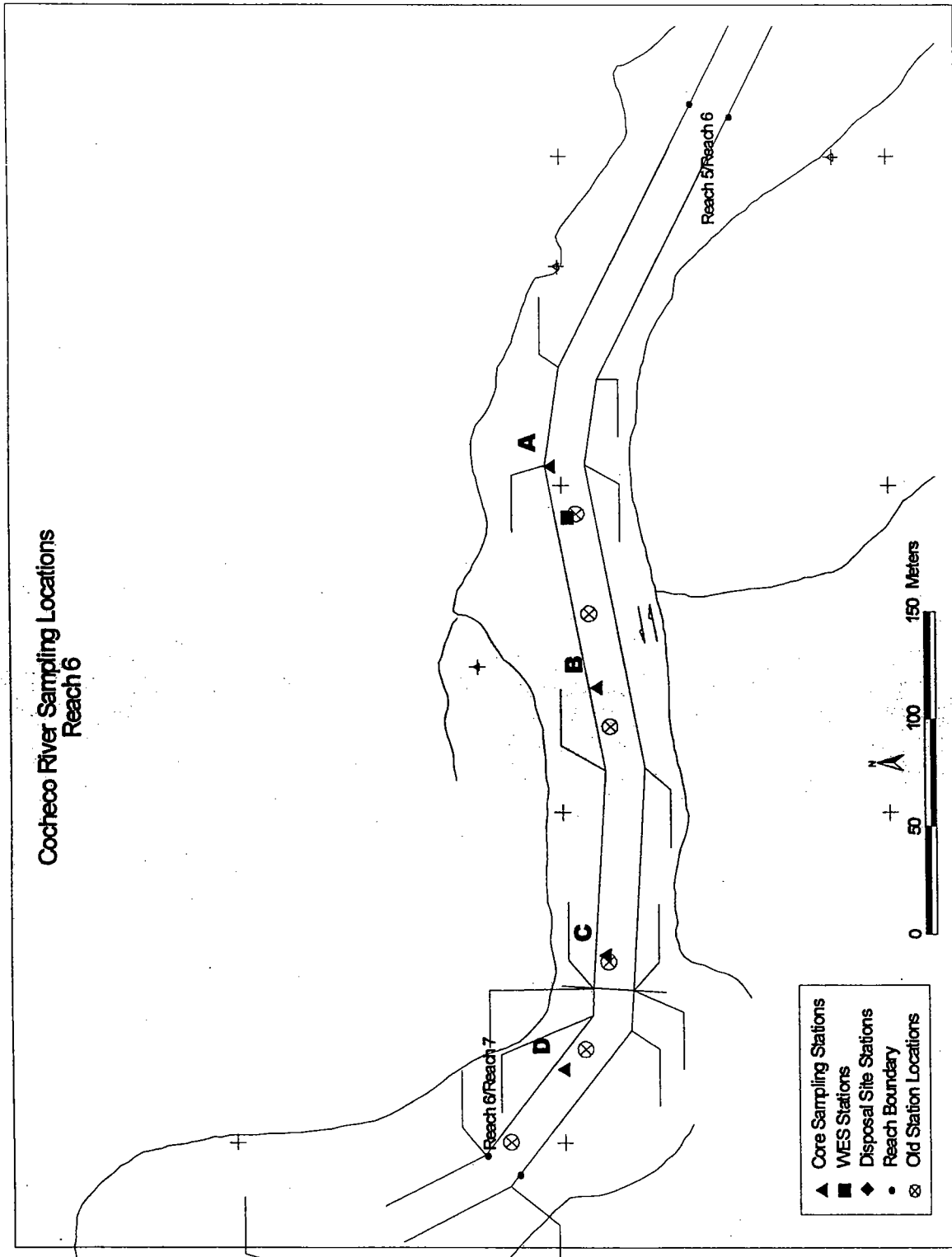


Figure 7. Cocheco River Reach 6

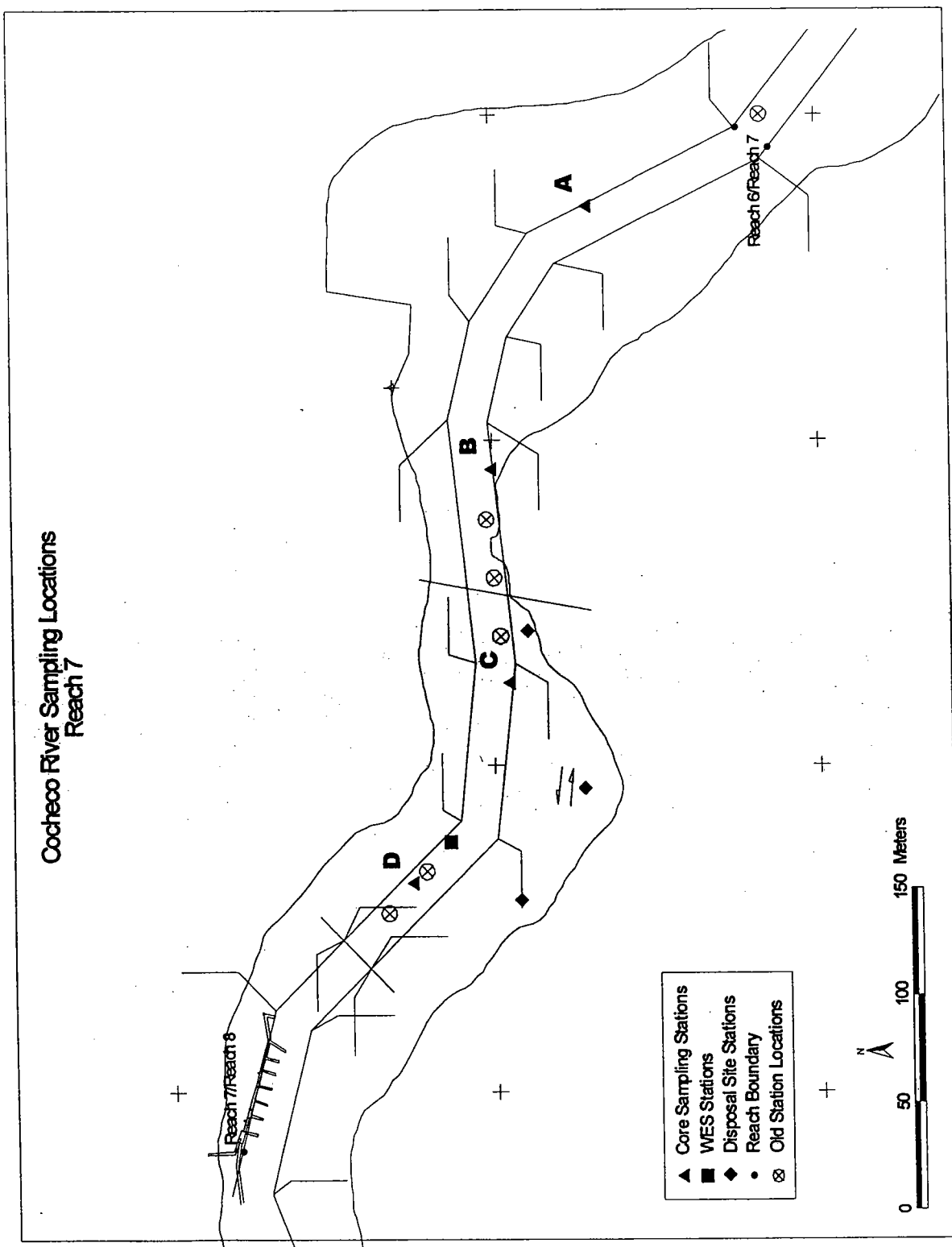


Figure 8. Cocheco River Reach 7

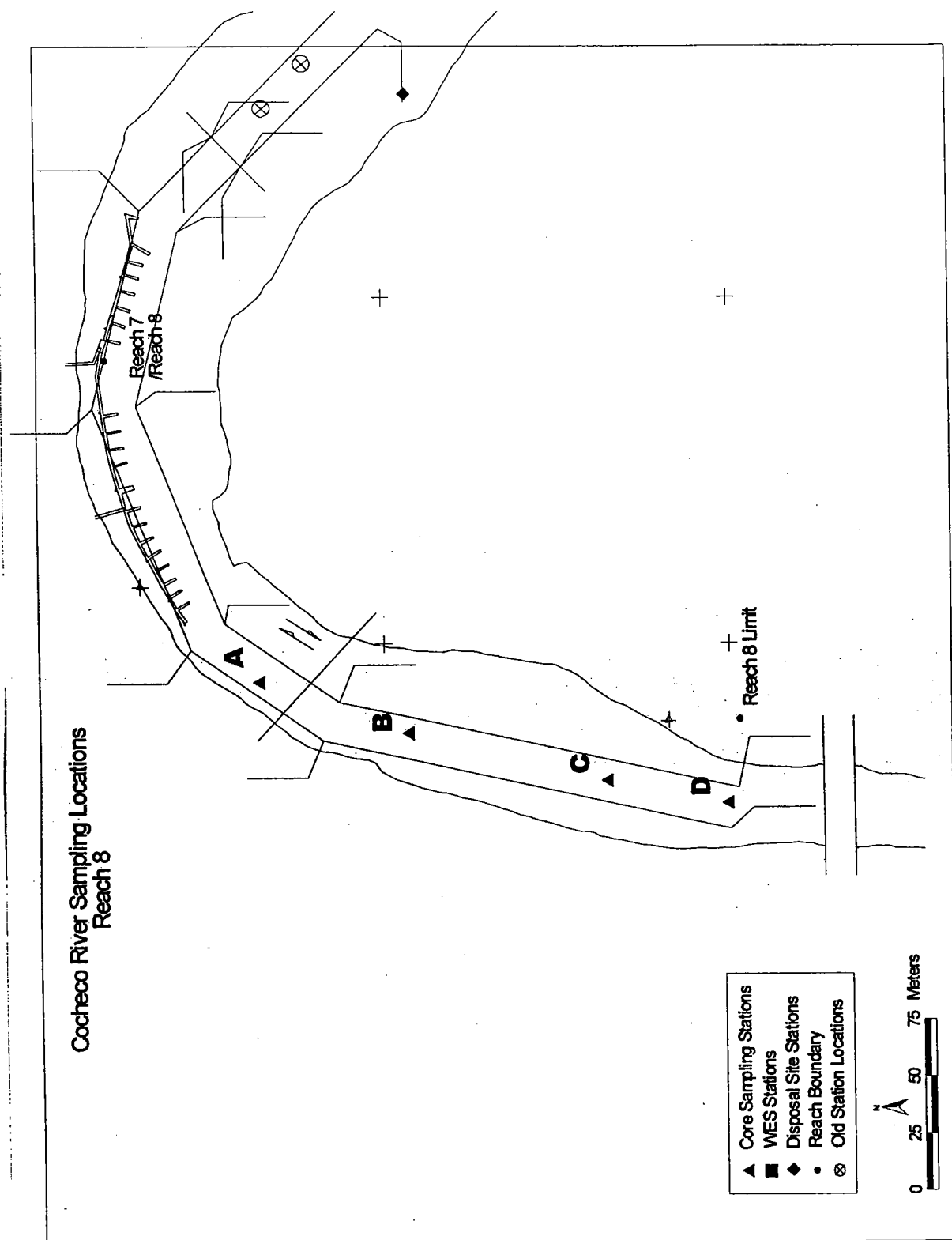


Figure 9. Cocheco River Reach 8

Sampling Schedule

Field operations on the Cocheco River began on Wednesday, November 12, 1997 and ended on Thursday, November 20, 1997. Actual sediment and water sampling began on Thursday, November 13, 1997.

Table 1 is a list of the samples collected by location, and the collection dates.

2.1.1 Sediment Core Collection and Compositing

Sediment cores were collected to -8 ft Mean Low Water (MLW) from each of eight adjoining sampling Reaches within the Cocheco River. Sampling location coordinates are presented in Attachment A, as are detailed descriptions of the sampling methods and equipment. Briefly, a vibratory coring device, lined with a 3.5 inch internal-diameter Lexan (plastic) tube, was used to retrieve cores. Cores of acceptable length were sealed, labeled and stored cold (~4°C) until description and compositing.

Individual sediment cores were split lengthwise for geologic description and then homogenized using stainless steel compositing equipment. Equal portions of sediment from each of 4 cores within each reach were composited for METs. The composited sediment was placed in 3.5 gallon buckets lined with Teflon bags. The Teflon bags were obtained from Welch Fluorocarbon in Dover, NH. The Teflon bags were then sealed using a nylon cable tie and the bucket lids secured. The buckets were labeled with the Reach number and placed in a cooler containing ice for shipment to Soil Technology for MET analysis. All sediment samples were shipped via overnight courier and contained signed chain of custody documents.

Table 1 Sampling Locations, Types and Dates

Sample Location	Sample Type						Date Collected
	MET Sediment Cores (1)	MET Water	Ambient Water - Total	Ambient Water - Dissolved	WES - Sediment Cores (2)	WES - Surface Sediment	
Reach 8	X	X	X				11/13/97
Reach 7	X	X	X	X	X (11/16/97) ⁽³⁾		11/13/97
Reach 6	X	X	X	X			11/14/97
Reach 5	X	X	X		X (11/16/97)		11/14/97
Reach 4	X	X	X		X (11/16/97)		11/15/97
Disposal Site Near	X	X	X	X			11/17/97
Disposal Site Up	X	X	X				11/17/97
Disposal Site Down	X	X	X				11/17/97
Reach 3	X	X	X				11/17/97
Reach 2	X	X	X			X (11/16/97)	11/18/97
Reach 1	X	X	X				11/18/97
Field Blank Water			X				11/19/97

Notes:

- (1) MET - Modified Elutriate Test; composite of a minimum of 4 cores per reach.
- (2) WES - Waterways Experiment Station; composite of 5 cores from Reaches indicated.
- (3) WES samples collected on date indicated.

2.1.2 Additional Sediment Collection for the Waterways Experiment Station (WES)

Additional sediment cores were collected to obtain sediment for work to be performed at the USACE Waterways Experiment Station in Vicksburg, Mississippi. Cores were collected at locations previously sampled by the USACE. Specific coordinates for these samples are provided in Attachment A. Cores were split, and homogenized into one single 5 gallon composite. The composited sediment was then placed in a 5 gallon bucket, sealed, labeled and placed in a cooler with ice and shipped via overnight courier to WES.

Surface sediment was also collected for WES. One 25-gallon composite was made from surface sediment obtained by Ponar grab from Reach 2, in a previously sampled area. The composite was made by mixing approximately 25 gallons of surface sediment in a large 120 quart cooler using a metal hoe. The sediment was then placed in 8 separate 3.5-gallon buckets. The buckets were sealed, labeled and shipped in coolers with ice via overnight courier to WES. All samples sent to WES were accompanied by signed chain-of-custody documents.

2.1.3 Ambient Water Collection and Compositing

Ambient water samples were collected from each Reach and at three designated locations adjacent to the proposed disposal site (near – directly off the site, up – immediately above the site, and down – immediately below the site). Ambient water was collected at 4 different periods during the tidal cycle: low slack, mid-flow, high-slack and mid-ebb and homogenized to make up a single sample per location. Water was collected using a submersible pump (standard Rule Submersible Pump w/ Teflon seals) from 2 to 3 feet off the bottom and pumped directly into Teflon lined 3.5 gallon buckets (high density polyethylene, FDA grade) using 1-inch diameter Tygon tubing. To allow for homogenization of large volumes of water (up to 45 gallons at some sites), individual buckets from each Reach were filled one quarter full at each of the 4 tidal cycles. Due to the cold ambient temperatures, the buckets were allowed to remain sealed on the deck of the barge between cycles. Subsamples from each tidal cycle within each reach were collected in 1-liter poly bottles for temperature, pH and salinity measurements.

2.1.3.1 Subsampling of Ambient Water for Chemical Analyses

Upon collection of a full bucket (encompassing a complete tidal cycle as described above), the buckets were removed from the barge and, depending on ambient temperatures, either placed outside of the sample processing area or stored in coolers with ice until sub-sampling for ambient water chemical analyses occurred. Generally, subsamples for parameters that required field filtration and/or preservation were subsampled immediately after the final tidal period sample was collected. These parameters included volatile organics, total and dissolved metals, methyl mercury, cyanide, and chromium (VI). The remaining subsampling occurred within 24 hours of sample collection and samples were then stored in coolers with ice and shipped via overnight courier to the appropriate analytical laboratory. Table 2 lists the types of samples collected and the appropriate container, preservation requirement and laboratory receiving the sample. A complete list of target analytes is provided in Attachment B. Chain of custody documents accompanied all samples as described in section 2.6.1. Copies of all custody forms are provided in Attachment C.

Table 2 Ambient Water: Parameter, Container Type, Preservation and Analytical Laboratory

Parameter	Container Type	Preservation	Laboratory
PCB/Pest/Semivolatiles	1-Liter glass	Cold, 4°C	BDO
TPH	1-Liter glass	Cold, 4°C	BDO
Diquat*	1-Liter glass *	Cold, 4°C	Philip
Ethylene Glycol *			
Endothall *			
Carbamates	1-Liter glass	Cold, 4°C	Philip
Atrazine/Simazine	1-Liter glass	Cold, 4°C	Philip
Herbicides	1-Liter glass	Cold, 4°C	Philip
CN / Cr (VI)	250 ml - plastic	NaOH, pH>12	Philip
Metals	1-Liter Poly	Acid, pH<2	MSL
Hg	1 - Liter Teflon	HCl, pH <2	BDO
Me Hg	250 ml Teflon	0.5% HCl, pH <2	MSL
Volatiles	40ml septum vial	HCl, pH<2	BDO
TSS	250 ml plastic	7 days cold, 4°C	Philip
Hardness	250 ml plastic	HNO ₃ , pH<2	Philip

* Samples for these parameters were collected together in one 1-L container.

BDO = Battelle Duxbury Operations; Duxbury, MA

MSL = Battelle Marine Sciences Laboratory; Sequim, WA.

Philip = Philip Analytical Services; Seattle, WA.

2.1.3.2 Field Filtration for Dissolved Ambient Waters

Ambient water from 3 Reaches (Reaches 5, 6 and 7) and water from the “near” disposal site, were also subsampled for dissolved analyses. Samples collected for parameters that required preservation in the field were filtered upon collection, prior to subsampling and preservation. These included metals (including mercury), methyl mercury, cyanide, chromium (VI) and hardness. Subsamples for dissolved analyses of these parameters were filtered using a peristaltic pump fitted with precleaned (using hydrochloric acid) c-Flex polymer tubing. Filtration was performed using a 0.45 micron cartridge filtration unit, also acid cleaned prior to use.

2.1.4 Water for Modified Elutriate Test (MET) Preparation

The remaining water to be used for MET preparation was sealed in the Teflon lined buckets and shipped in coolers with ice via overnight courier to Soil Technology. The Teflon bag within each bucket was sealed with nylon cable ties prior to sealing the buckets. Chain-of-custody documents accompanied all samples as described in section 2.6.1. Copies of all custody forms are provided in Attachment C.

2.1.5 Field Measurements

Field measurements performed on water samples included temperature, salinity and pH. Temperature was taken with a battery-operated probe at each of the 4 tidal cycles during collection. The temperature measurements in degrees Celsius are provided in Attachment A. Salinity was measured using an ATAGO S-10 hand-held refractometer calibrated to 0 ‰ using milli-Q water. pH was measured using a portable hand held pHastcheck meter (VWR Brand). The meter was calibrated using 2 buffers (pH 4 and pH 7) at

room temperature prior to field sample measurements. The meter was checked for calibration using 2 buffers before and after actual measurements. Samples were kept at 4°C until measurement.

2.2 Modified Elutriate Tests

2.2.1 Procedure Summary

Sediment and site water samples were collected by BDO's contractor OSI from 8 reaches and submitted to STI in 5-gallon polyethylene buckets lined with Teflon bags. Approximately 80% of the Teflon liners were observed to have leaked upon receipt by STI. Based on results of background elutriate water results, it does not appear that samples for MET preparation were compromised. In addition, site waters for ambient chemical analyses were subsampled prior to shipping the buckets and prior to any leakage.

METs were performed on both the sediment and background water from each reach. For METs performed on background water, testing was conducted in the same manner as for the sediment, except no sediment was used, only water. All tests were performed in triplicate, at the request of BDO. For the sediment testing, three separate METs were performed for each reach, using three separate aliquots of sediment and surface water. For the background water testing, one MET was performed for each reach, from which, the elutriate was then split into three separate samples. All elutriates generated from the sediment and background water testing were submitted to chemical laboratories for analysis of total compounds, which are listed in Section 2.3. In addition, elutriates generated from Reaches 5, 6 and 7 were submitted to chemical laboratories for analysis of dissolved compounds. For quality control/quality assurance purposes, one triple volume method spike/method spike duplicate was generated for the Reach 6 background water/dissolved fraction MET and Reach 1 sediment/total fraction MET. A total of 15 sediment/total fraction only METs; 8 background water/total fraction METs; 9 sediment/dissolved and total fraction METs; and 4 background water/dissolved fraction METs were conducted for this project. Table 3 summarizes the testing, elutriate samples, and the volume of elutriates generated.

Elutriates generated for the sediments collected from Reaches 3 through 8 were observed to have an oily sheen. Elutriate generated from Reach 8 was observed to have the greatest amount of oily substance floating on the surface. The sediment from Reach 8 was also observed to be black and oily in nature.

All METs were performed in accordance with USCOE methodology, "Modified Elutriate Analysis, *Interim Guidance for Prediction Quality of Effluent Discharged from Confined Dredged Material Disposal Areas -- Test Procedures*, EEDP-04-2: Environmental Effects of Dredging, Technical Notes, 1985" (also referenced in the 1994 Inland Testing Manual; USACE 1994). The elutriate sediments were homogenized and tested under ambient atmospheric conditions. All METs were conducted at the recommended concentration of 150 grams of solids to 1 liter of site water (150 g/l). For each test, the appropriate amount of sediment and site water was mixed, aerated for 1 hour, then allowed to settle for 24 hours. Supernatant was siphoned off, and when required, split into two fractions: one for total chemical analysis and one for dissolved analysis. Elutriate slated for total chemical analysis was placed into the appropriate sample bottle, preserved, and shipped to the appropriate chemical laboratory. Elutriate slated for dissolved chemical analysis was centrifuged and filtered before being bottled, preserved, and shipped to the appropriate chemical laboratory. Attachment C contains copies of the chain-of-custody forms for the elutriate samples.

Table 3 Summary of Modified Elutriate Testing Samples and Test Preparation Schedule

Reach Number	MET Type	MET Volume (liters)	Sample ID	Date Sampled	Date Shipped
6	Background Water Dissolved Fraction	21	6-DISB-A 6-DISB-B 6-DISB-C	11/18/97	11/19/97
6	Background Water Total Fraction	21	6-TOTB-A 6-TOTB-B 6-TOTB-C	11/18/97	11/19/97
8	Sediment - Total Fraction	7	8-TOT-A	11/19/97	11/20/97
8	Sediment - Total Fraction	7	8-TOT-B	11/19/97	11/20/97
8	Sediment - Total Fraction	7	8-TOT-C	11/19/97	11/20/97
8	Background Water Total Fraction	21	8-TOTB-A 8-TOTB-B 8-TOTB-C	11/19/97	11/20/97
4	Sediment - Total Fraction	7	4-TOT-A	11/19/97	11/20/97
4	Sediment - Total Fraction	7	4-TOT-B	11/19/97	11/20/97
4	Sediment - Total Fraction	7	4-TOT-C	11/19/97	11/20/97
7	Background Water Dissolved Fraction	21	7-DISB-A 7-DISB-B 7-DISB-C	11/20/97	11/21/97
7	Sediment - Total and Dissolved Fractions	14	7-TOT-A 7-DIS-A	11/20/97	11/21/97
7	Sediment - Total and Dissolved Fractions	14	7-TOT-B 7-DIS-B	11/20/97	11/21/97
7	Sediment - Total and Dissolved Fractions	14	7-TOT-C 7-DIS-C	11/20/97	11/21/97
4	Background Water Total Fraction	3	4-TOTB-A 4-TOTB-B 4-TOTB-C	11/20/97	11/24/97
5	Background Water Total Fraction	3	5-TOTB-A 5-TOTB-B 5-TOTB-C	11/20/97	11/24/97
7	Background Water Total Fraction	3	7-TOTB-A 7-TOTB-B 7-TOTB-C	11/20/97	11/24/97
6	Sediment Total and Dissolved Fractions	14	6-TOT-A 6-DIS-A	11/21/97	11/24/97
6	Sediment Total and Dissolved Fractions	14	6-TOT-B 6-DIS-B	11/21/97	11/24/97
6	Sediment Total and Dissolved Fractions	14	6-TOT-C 6-DIS-C	11/21/97	11/24/97
3	Sediment - Total Fraction	7	3-TOT-A	11/21/97	11/24/97
3	Sediment - Total Fraction	7	3-TOT-B	11/21/97	11/24/97
3	Sediment - Total Fraction	7	3-TOT-C	11/21/97	11/24/97
5	Sediment - Total and Dissolved Fractions	14	5-TOT-A 5-DIS-A	11/22/97	11/24/97
5	Sediment - Total and Dissolved Fractions	14	5-TOT-B 5-DIS-B	11/22/97	11/24/97
5	Sediment - Total and	14	5-TOT-C	11/22/97	11/24/97

Reach Number	MET Type	MET Volume (liters)	Sample ID	Date Sampled	Date Shipped
	Dissolved Fractions		5-DIS-C		
1	Background Water Total Fraction	3	1-TOTB-A 1-TOTB-B 1-TOTB-C	11/23/97	11/24/97
2	Background Water Total Fraction	3	2-TOTB-A 2-TOTB-B 2-TOTB-C	11/23/97	11/24/97
3	Background Water Total Fraction	3	3-TOTB-A 3-TOTB-B 3-TOTB-C	11/23/97	11/24/97
6	Background Water Dissolved Fraction Triple Volume MS/MSD	21	6-DISB	11/24/97	11/25/97
1	Sediment - Total Fraction	7	1-TOT-A	11/25/97	11/25/97
1	Sediment - Total Fraction	7	1-TOT-B	11/25/97	11/25/97
1	Sediment - Total Fraction Triple Volume MS/MSD	21	1-TOT-C	11/25/97	11/25/97
5	Background Water Dissolved Fraction	21	5-DISB-A 5-DISB-B 5-DISB-C	11/1/97	12/1/97
2	Sediment - Total Fraction	7	2-TOT-A	11/2/97	12/3/97
2	Sediment - Total Fraction	7	2-TOT-B	11/2/97	12/3/97
2	Sediment - Total Fraction	7	2-TOT-C	11/2/97	12/3/97

MET - Modified Elutriate Testing.

MS/MSD - Method spike/method spike duplicate.

2.2.2 Centrifuging and Filtering

The leachate generated by the MET slated for dissolved fraction analysis was centrifuged, filtered, and submitted for chemical analysis of organic and inorganic fractions. Centrifuging and filtering was performed on the day the elutriate was decanted. Table 4 summarizes the centrifuging, filtering, and chemical analysis parameters described below.

For the organic fraction, stainless steel and glass equipment was used, which were decontaminated as per EPA SW-846 Methods of Analysis. A sufficient volume of elutriate was centrifuged at 6500 rpm for 30 minutes. The leachate was then decanted using a glass baster to minimize the re-entrainment of settled particles. The organic fraction was not filtered as per the COE method for elutriate testing. The samples were then shipped to the appropriate laboratory for chemical analysis of polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), chlorinated pesticides, total petroleum hydrocarbons (TPH), Diquat, ethylene glycol, Endothall, carbamates, Atrazine, Simazine, and chlorinated herbicides.

The inorganic fraction was prepared using polycarbonate and polysulfon materials, which were decontaminated as per EPA SW-846 Methods of Analysis. A sufficient volume of elutriate was centrifuged at 9000 rpm for 30 minutes. The leachate was then filtered using 0.45 µm cellulose acetate filters, preserved, and shipped the appropriate laboratory for chemical analysis of cyanide, hexavalent chromium, total metals, mercury, and methyl mercury.

Filters were prepared for use by acid-washing the cellulose acetate filters as per SW-846 EPA Methods of Analysis. Pre-cleaned glass bottles were used for the collection of organic fractions and pre-cleaned polypropylene bottles were used for inorganic fractions, all of which were supplied by BDO.

Table 4 MET Summary of Centrifuging, Filtering and Analytical Parameters

TYPE	Organics		Inorganics	
	Dissolved	Total	Dissolved	Total
Time Centrifuge Rev/min.	30 min 6500 x g	None	30 min 9000 x g	None
Type Centrifuge bottles	Stainless Steel	None	Polycarbonate	None
Volume Collected	6 liters	6 liters	1 liter	1 liter
Filters Used	None	None	0.45 μ m cellulose acetate	None
Analysis	PAH/PCB/Pest; TPH; Diquat; ethylene glycol; Endothall; carbamates; Atrazine/Simazine, herbicides;	PAH/PCB/Pest; TPH; Diquat; ethylene glycol; Endothall; carbamates; Atrazine/Simazine, herbicides;	CN; Cr (VI); Metals; Hg; Methyl Hg	CN; Cr (VI); Metals; Hg; Methyl Hg

PAH - Polyaromatic Hydrocarbon

PCB - Polychlorinated biphenyl

TPH - Total petroleum hydrocarbon

CN - cyanide

Cr (VI) - Hexavalent chromium

Hg - Mercury

2.2.3 Sample Nomenclature

Samples were named according to the following parameters. The prefix "1" through "8" was used to denote the reach. The suffix "A", "B", and "C" was used to denote the three samples generated by the triplicate testing. The main body of the sample name denoted the test type: for sediment total fractions, "TOT" was used; for sediment dissolved fractions, "DIS" was used; for background water total fractions, "TOTB" was used; and for background water dissolved fractions, "DISB" was used.

2.2.4 Chemical Analyses

Elutriates were submitted for total and/or dissolved chemical analysis of PAH, PCB, chlorinated pesticides, TPH, Diquat, ethylene glycol, Endothall, carbamates, Atrazine, Simazine, chlorinated herbicides, cyanide, hexavalent chromium, total metals, mercury, and methyl mercury. All elutriates were analyzed for these compounds, except for the background water total fractions, which were only analyzed for cyanide, hexavalent chromium, total metals, mercury, and methyl mercury.

Samples were shipped to the chemical laboratories for analysis from November 19 through December 3, 1997. Samples slated for total metals and methyl mercury analyses were shipped to Battelle Marine Science Laboratory in Sequim, Washington. Samples slated for mercury, TPH, PAH, PCB, and

chlorinated pesticide analyses were shipped to Battelle Duxbury Operations Laboratory in Duxbury, Massachusetts. Samples slated for cyanide, hexavalent chromium, Diquat, ethylene glycol, Endothall, carbamates, Atrazine, Simazine, and chlorinated herbicides analyses were shipped to Philip Analytical Services in Burnaby, British Columbia. All samples were kept cold until received by the laboratory and were shipped under strict chain-of-custody. Samples slated for methyl mercury analysis were preserved with hydrochloric acid and samples slated for cyanide and hexavalent chromium were preserved with sodium hydroxide. Table 5 summarizes the elutriate samples collected for chemical analyses along with the preservation and laboratories associated with each analysis type.

Table 5 Elutriate Water: Parameters, Container Type, Preservation and Analytical Laboratory

Parameter	Container Type	Preservation	Laboratory
PCB/Pest/Semivolatiles	1-Liter glass	Cold, 4°C	BDO
TPH	1-Liter glass	Cold, 4°C	BDO
Diquat*	1-Liter glass *	Cold, 4°C	Philip
Ethylene Glycol *			
Endothall *			
Carbamates	1-Liter glass	Cold, 4°C	Philip
Atrazine/Simazine	1-Liter glass	Cold, 4°C	Philip
Herbicides	1-Liter glass	Cold, 4°C	Philip
CN / Cr 6+	250 ml - plastic	NaOH, pH>12	Philip
Metals	1-Liter Poly	Acid, pH<2	MSL
Hg	1 - Liter Teflon	HCl, pH <2	BDO
Me Hg	250 ml Teflon	0.5% HCl, pH <2	MSL
TSS	250 ml plastic	7 days cold, 4°C	Soil Tech

* indicates all parameters collected in a single container.

2.3 Sediment Grain Size, Atterberg Limits and Total Organic Carbon Procedures

2.3.1 Grain Size

Composite sediment samples from each of the 8 Reaches underwent grain size testing according to Puget Sound Estuary Protocol (PSEP 1997) methods with dissolved salt correction. One replicate analysis was performed as a QA/QC sample. Re-analysis of the data was performed according to ASTM Method D-2487 which included classification of the sediments and plots of the data.

2.3.2 Atterberg Limits

Atterberg Limits were performed according to ASTM D-4318. One replicate analysis was performed.

2.3.3 Total Organic Carbon (TOC)

TOC analysis was performed by Philip Analytical, in Burnaby, British Columbia, according to EPA method 9060 using a LECO carbon analyzer.

2.4 Procedures for TCLP Analyses

2.4.1 TCLP Extractions

The Toxicity Characteristic Leaching Procedure (TCLP) was performed by Philip Analytical of Burnaby, British Columbia following EPA Method 1311 (EPA 1992). TCLP extracts were analyzed for a variety of inorganic and organic parameters.

2.4.2 Inorganic Analyses

Inorganic parameters analyzed in TCLP extracts include 19 metals. All metals were analyzed directly following EPA Method 6010 using inductively coupled plasma atomic emission spectroscopy (ICPAES), except Hg which was analyzed by EPA Method 7470.

2.4.3 Organic Procedures

Organic parameters analyzed in TCLP extracts include semivolatile organics by EPA Method 8270, chlorinated pesticides and PCB Aroclors by EPA Method 8081, volatile organics by EPA Method 8260, and herbicides by EPA Method 8151.

2.5 Procedures for Chemical Analyses of Ambient and Elutriate Water

The list of chemical parameters measured in both ambient and elutriate water samples was specified in the scope of work for the project and was based on New Hampshire Department of Environmental Services (NHDES) Risk Characterization and Management Policy. This list and associated soil standards are presented in Attachment B. The following sections describe the methods used to perform these analyses.

2.5.1 Miscellaneous Inorganics – TSS, Hardness, CN, Cr(VI)

TSS - Total suspended solid (TSS) analysis in ambient waters was conducted by Philip in accordance with SM18 2540D. Total suspended solid (TSS) analysis in elutriates was conducted by Soil Technology on each total fraction elutriate in accordance with EPA Method 160.2.

Hardness - Hardness was measured in ambient water samples only by Philip Analytical following SM18 2340C. Samples were preserved in the field using

CN - Cyanide (CN) was measured in both ambient and elutriate waters by Philip Analytical in accordance with EPA Method 9010. All samples were preserved with sodium hydroxide and kept cold at 4°C until analysis.

Cr(VI) - Hexavalent Chromium was measured in both ambient and elutriate waters following SM18 3500. All samples were preserved with sodium hydroxide and kept cold at 4°C until analysis.

2.5.2 Metals Analyses

Fourteen metals were analyzed in both ambient and elutriate water samples. These metals include, antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), and zinc (Zn). Sb, Ba, Be, B, Cd, Cu, Pb, Ni, Ag, Tl, and Zn were prepared using a total recoverable metals (TRM) digestion: sample aliquots were treated with nitric acid and heated prior to analysis. For analysis of As, Cr, and Se, samples were preconcentrated according to a reductive precipitation procedure (Nakashima et al. 1988). Iron (Fe) and palladium (Pd) were added to each sample aliquot followed by a sodium tetrahydroborate solution to form a precipitate. The precipitate was then filtered and dissolved with nitric and hydrochloric acids, and the resulting acid mixture was analyzed. All metals were analyzed by inductively coupled plasma mass spectrometry (ICP/MS) following EPA Method 200.8 (EPA 1991).

2.5.3 Mercury Analysis

Ambient and elutriate samples were acidified upon receipt at the laboratory and stored at ambient temperature until analysis. Mercury (Hg) was analyzed following EPA Method 245.1 (EPA 1991) using cold vapor atomic fluorescence (CVAF). Mercury was analyzed within 28 days of sample collection.

2.5.4 Methyl Mercury Analyses

Ambient and elutriate samples for methyl mercury were received already acidified with HCl and were stored at ambient temperature until analysis. Samples for methylmercury were prepared using the distillation method of Horvat, et al., 1993, analyzed by aqueous phase ethylation, GC separation, and quantified by Cold Vapor Atomic Fluorescence (CVAA).

2.5.5 Volatile Organic Analyses

Ambient water samples were collected in 40 ml septum vials containing a premeasured volume of acid. Trip blanks accompanied all shipments of volatile organic samples. Volatile organics were analyzed by purge and trap, gas chromatography/mass spectrometry (GC/MS) following modified EPA method 8260.

2.5.6 Total Petroleum Hydrocarbon Analyses

Ambient and elutriate waters were analyzed for TPHs following a method similar to EPA Mod8015. Samples were extracted using methylene chloride. Extracts were reduced and run through an alumina column to remove the biogenic hydrocarbons. Extracts were analyzed using gas chromatography/flame ionization detection (GC/FID).

2.5.7 Semivolatile Organic Analyses

Ambient and elutriate samples were analyzed for Semivolatile Organics. Samples were extracted using methylene chloride. Extracts were reduced, cleaned using alumina column chromatography and HPLC if necessary, and analyzed in full scan mode using gas chromatography/mass spectrometry (GC/MS) following a modified EPA method 8270. The majority of the results reported are from extracts that did not go through either column or HPLC clean-up steps.

2.5.8 Polychlorinated Biphenyl and Chlorinated Pesticide Analyses

Ambient and elutriate samples were analyzed for PCBs and Pesticides. Samples were extracted using methylene chloride, along with samples for TPH and semivolatile organics. Extracts were split and the PCB/pesticide fraction was reduced, cleaned using Al column chromatography and HPLC and analyzed for 22 individual PCB congeners and 21 chlorinated pesticides using gas chromatography/electron capture detection (GC/ECD) following a modified EPA method 8081.

2.5.9 Phenoxy Acid Herbicide Analyses

Ambient and Elutriate waters were analyzed for herbicides following EPA method 8151.

2.5.10 Solvent Soluble Herbicide Analyses – Atrazine/Simazine

Ambient and elutriate samples were analyzed for atrazine and simazine following a modified version of EPA method 525.1.

2.5.11 Special Organic Analyses

Ambient and elutriate waters were analyzed for additional organic compounds including ethylene glycol, following EPA method 8015 modified and for endothall following EPA method 548.1.

2.6 Quality Assurance/Quality Control Procedures

The quality assurance/quality control (QA/QC) procedures for the Cocheco River project were consistent with the *New England Guidance Manual*. All chemical analyses were audited by the laboratory QA representative for the specific laboratory where the analysis was performed. Table 6 lists the data quality objectives (DQO's) for this project, against which all data from this program were evaluated. Table 7 lists the data qualifiers that were used to flag data which did not meet the DQOs or which were suspect.

2.6.1 Sample Tracking and Storage

Chain-of-custody forms accompanied all sediment samples from the time of collection to receipt at the appropriate laboratories. Copies of all chain-of-custody forms are provided in Attachment C.

Table 6 Cocheco River Project Data Quality Objectives

QC Measure	Minimum Frequency	DQO/Acceptance Criteria	Out of limit action
Initial Calibration		Organics: 25% RSD individual analyte, or 15% RSD average Inorganics: min. 3-point curve, $r > 0.99$	Check for error, and/or remake standards/reagents and recalibrate
Continuing Calibration Verification (CCV)	every 10 samples; mid level calibration standard	Organics: 25% PD individual analytes; Inorganics: 15% PD from "true" value	Check instrument, restart and reject any samples not bracketed by acceptable CCV.
Surrogates	Organics only; all samples	50-150%	Results examined by project management or task leader. Corrective action (reextraction, reanalysis) or flag QC data and provide narrative.
Blank Spike	1/sample set	Organics: 40 to 120% R (for at least 80% of analytes) Metals: 70 to 130% R	N/A, internal QC only
Method Blank	1 per batch of 20 field samples	<5x MDL or <1/5 sample concentration	Report to Task leader, reprocess sample batch as needed or flag QC data and provide narrative.
Field Replicates	Waters: all samples in triplicate, Sediments: duplicate per batch of 20 samples	Triplicates: $RSD \leq 30\%$ RPD unless sample concentrations are < 10x MDL Duplicates: $RPD \leq 30\%$ RPD	Report to Task leader, reprocess sample batch as needed or flag QC data and provide narrative.
Matrix Spikes/matrix spike duplicates	1 per batch of 20 field samples	Organics: 40-120 % recovery (for at least 80% of analytes) Inorganics: 70-130 % recovery (* unless spike conc. is less than the sample conc.)	Report to Task leader, reprocess sample batch as needed or flag QC data and provide narrative.
Reference Materials SRM)or laboratory control sample (LCS)	1 per batch of 20 field samples	70-130 percent of certified value for all certified analytes.	Report to Task leader, reprocess sample batch as needed or flag QC data and provide narrative.

Notes:

MDL: method detection limit; PD: percent difference; SIS: surrogate internal standard; R: recovery;
RSD: relative standard deviation; SRM: standard reference material

Data Reporting Qualifiers

Table 7 Data Reporting Qualifiers

Data Qualifier	Definition
J	Detected, but below the MDL ¹ .
E	Estimate; significant matrix interference.
B	Analyte detected at <5X the blank concentration.
U	Not detected; MDL reported.
&	QC value outside the accuracy or precision criteria goal (Table 7.1).

¹ Analyte signal sufficient to confidently identify and quantify analyte (signal-to-noise ratio of approximately 5:1), but concentration is below the reported MDL. Recently determined, appropriate, analyte-specific MDLs will be reported.

3.0 RESULTS AND DISCUSSION

Results of all field and laboratory measurements are presented and discussed in this section. Complete results for all sediment measurements, TCLP, ambient and elutriate chemical analyses and associated quality control results are presented in attachments D, E, F and G, respectively. The following includes summaries of selected parameters and brief discussions of the results and observations.

3.1 Results of Field Measurements

Table 8 provides results for both salinity and pH. While pH remained fairly constant throughout the river, the salinity varied relative to proximity to the mouth of the river and the tidal cycle sampled.

Table 8 Field Measurements; pH and Salinity

Location	Tide	Sampling Date	pH *		Salinity	
			Date measured	Value	Date measured	Value (‰)
Reach 1	low-Slack	11/17/97	11/20/97	7.4	11/18/97	14
Reach 1	mid-Ebb	11/17/97	11/20/97	7.4	11/18/97	21
Reach 1	mid-Flow	11/17/97	11/20/97	7.4	11/18/97	25
Reach 1	high-Slack	11/17/97	11/20/97	7.4	11/18/97	30
Reach 2	low-Slack	11/17/97	11/20/97	7.5	11/18/97	14
Reach 2	mid-Ebb	11/17/97	11/20/97	7.4	11/18/97	10
Reach 2	mid-Flow	11/17/97	11/20/97	7.4	11/18/97	21
Reach 2	high-Slack	11/17/97	11/20/97	7.5	11/18/97	26
Reach 3	low-Slack	11/17/97	11/20/97	7.3	11/18/97	16
Reach 3	mid-Ebb	11/17/97	11/20/97	7.1	11/18/97	18
Reach 3	mid-Flow	11/17/97	11/20/97	7.5	11/18/97	16
Reach 3	high-Slack	11/17/97	11/20/97	7.6	11/18/97	26
Reach 4	low-Slack	11/15/97	11/20/97	7.3	11/18/97	10
Reach 4	mid-Ebb	11/15/97	11/20/97	7.3	11/18/97	13
Reach 4	mid-Flow	11/15/97	11/20/97	7.3	11/18/97	18

Location	Tide	Sampling Date	pH *		Salinity	
			Date measured	Value	Date measured	Value (‰)
Reach 4	high-Slack	11/15/97	11/20/97	7.5	11/18/97	25
Reach 5	low-Slack	11/14/97	11/20/97	7.5	11/18/97	4
Reach 5	mid-Ebb	11/14/97	11/20/97	7.4	11/18/97	19
Reach 5	mid-Flow	11/14/97	11/20/97	7.2	11/18/97	9
Reach 5	high-Slack	11/14/97	11/20/97	7.3	11/18/97	20
Reach 6	low-Slack	11/14/97	11/20/97	7.4	11/18/97	3
Reach 6	mid-Ebb	11/14/97	11/20/97	7.3	11/18/97	12
Reach 6	mid-Flow	11/14/97	11/20/97	7.5	11/18/97	6
Reach 6	high-Slack	11/14/97	11/20/97	7.3	11/18/97	19
Reach 7	low-Slack	11/13/97	11/20/97	7.0	11/18/97	3
Reach 7	mid-Ebb	11/13/97	11/20/97	6.8	11/18/97	2
Reach 7	mid-Flow	11/13/97	11/20/97	7.4	11/18/97	2
Reach 7	high-Slack	11/13/97	11/20/97	7.1	11/18/97	5
Reach 8	low-Slack	11/13/97	11/20/97	7.3	11/18/97	2
Reach 8	mid-Ebb	11/13/97	11/20/97	6.9	11/18/97	12
Reach 8	mid-Flow	11/13/97	11/20/97	7.4	11/18/97	2
Reach 8	high-Slack	11/13/97	11/20/97	6.7	11/18/97	5
Disposal - near	low-Slack	11/17/97	11/20/97	7.0	11/18/97	2
Disposal - near	mid-Ebb	11/17/97	11/20/97	7.0	11/18/97	8
Disposal - near	mid-Flow	11/17/97	11/20/97	5.9	11/18/97	11
Disposal - near	high-Slack	11/17/97	11/20/97	7.0	11/18/97	11
Disposal - up	low-Slack	11/17/97	11/20/97	6.6	11/18/97	2
Disposal - up	mid-Ebb	11/17/97	11/20/97	7.0	11/18/97	5
Disposal - up	mid-Flow	11/17/97	11/20/97	5.0	11/18/97	10
Disposal - up	high-Slack	11/17/97	11/20/97	6.8	11/18/97	13
Disposal - down	low-Slack	11/17/97	11/20/97	7.0	11/18/97	3
Disposal - down	mid-Ebb	11/17/97	11/20/97	6.4	11/18/97	9
Disposal - down	mid-Flow	11/17/97	11/20/97	7.0	11/18/97	11
Disposal - down	high-Slack	11/17/97	11/20/97	7.0	11/18/97	12

* pH Initial Calibration Check: pH 7 = 7.00, pH 4 = 4.00

pH Final Calibration Check: pH 7 = 7.00, pH 4 = 4.40

3.2 Results of Sediment Measurements

Results for all sediment measurements are provided in attachments to this report. Percent moisture, Grain Size and Atterberg Limits, are provided in Attachment D. Total Organic Carbon (TOC) results are provided with the Philip Analytical TCLP results in Attachment E. Summaries of these results are provided below.

3.2.1 Sediment Total Organic Carbon and Percent Moisture

Both organic and inorganic carbon were measured in sediments from each Reach and results are presented in Attachment E. Table 9 summarizes the percent organic carbon as a fraction of the total dry weight of the sample. Note that the replicates were measured on separate aliquots of sediment, one sent directly from the field and the other sent from sediment further homogenized at Soil Technology prior to MET preparation. This may explain the high RPD for some of the replicates. In general, though, the RPDs were <30%, which is within the data quality objectives for precision for this project.

Table 9 Summary of Sediment Total Organic Carbon and Percent Moisture

Reach	Total Organic Carbon	RPD	% Moisture	RPD
Units: MDC:	% 1.00		%(W/W) 0.1	
Blank	< 1.00		---	
REACH 1	2.66		24.3	
REACH 1 rep 2	1.63	100%	22.8	25%
REACH 2	1.89		28.0	
REACH 2 rep 2	1.49	24%	29.2	4%
REACH 3	1.94		26.7	
REACH 3 rep 2	2.51	26%	27.7	4%
REACH 4	4.25		39.8	
REACH 4 rep 2	4.52	6%	38.7	3%
REACH 5	4.00		34.1	
REACH 5 rep 2	3.98	1%	33.0	3%
REACH 6	4.13		24.3	
REACH 7	0.67		11.3	
REACH 8	2.82		10.9	

RPD = Relative Percent Difference

MDC = Minimum Detectable Concentration

3.2.2 Grain Size Results

Grain size was measured using a combination of sieve and hydrometer methods. Results for percent passing for individual fractions and particle size distribution plots are presented in Attachment D. Table 10 summarizes grain size for each reach in the 4 major classifications: gravel, sand, silt and clay. Samples collected in the upper reaches of the River were generally higher in silt and clay content than the more sandy sediment present in the lower reaches, with the exception of Reach 8 which was primarily sand.

Table 10 Summary of Grain Size Distribution

REACH	Fractional Components				USCS Class
	Gravel	Sand	Silt	Clay	
Reach 1	0	88.8	6.2	4.1	SP-SM
Reach 2	0	73.4	19.5	7.1	SM
Reach 2 dup	0	74.4	18.5	7.1	SM
Reach 3	0	65.4	27.5	7.1	SM
Reach 4	0	60.3	30.3	8.4	SM
Reach 5	0	66.4	18.5	9.1	SC
Reach 6	0	51.1	33.8	3.1	SM
Reach 7	0	52.1	28.8	7.1	SM
Reach 8	0	78.8	2.2 ^a	0	SP

^a percent fines

3.2.3 Results of Ambient Water Physical and Inorganic Measurements (TSS, Hardness)

Ambient water total suspended solids (TSS) and hardness measurements are presented in Table 11. These measurements were not made in dissolved fractions of ambient waters. Dissolved Mg and Ca were also measured in these samples and are included in the Philip Analytical ambient water summary tables included in Attachment E.

3.3 Results of Elutriate Water Physical Measurements (TSS, Turbidity)

Elutriate TSS and Turbidity results are presented in Table 12. Total background TSS values were generally low or undetected and as a result, suspended solids and turbidity measurements originate from elutriate preparation. A separate, oily phase was observed for most of the elutriate samples after settling. For Reach 4 elutriates (4-TOT-A, 4-TOT-B, and 4-TOT-C), TSS results were highly variable (16 mg/l, 0 mg/l, and 534 mg/l, respectively). TSS for 4-TOT-C was duplicated with similar results of 670 mg/l. The differences between these results were probably due to the oily nature of the elutriates which made reproducible measurements difficult.

Table 11 Results of Ambient Water TSS and Hardness

Reach	Type	Replicate	TSS	Hardness
			Units: MDC: mg/L 4	mg/L 0.2
	Method Blank		< 4	
	Field Blank		< 4	< 0.2
Reach 1	Ambient Total	rep 1	6	2980
		rep 2	7	3210
		rep 3	17	3000
Reach 2	Ambient Total	rep 1	16	2450
		rep 2	13	2470
		rep 3	21	2450
Reach 3	Ambient Total	rep 1	16	2610
		rep 2	15	2600
		rep 3	14	2580
Reach 4	Ambient Total	rep 1	14	2160
		rep 2	17	2140
		rep 3	20	2170
Reach 5	Ambient Total	rep 1	15	1470
		rep 2	18	1460
		rep 3	18	1460
Reach 6	Ambient Total	rep 1	15	1120
		rep 2	18	1110
		rep 3	16	1120
Reach 7	Ambient Total	rep 1	9	341
		rep 2	10	342
		rep 3	10	344
Reach 8	Ambient Total	rep 1	11	454
		rep 2	12	451
		rep 3	10	448
Disposal- Near	Ambient Total	rep 1	11	1090
		rep 2	9	1090
		rep 3	7	1080
Disposal- Up	Ambient Total	rep 1	7	726
		rep 2	5	722
		rep 3	7	722
Disposal- Down	Ambient Total	rep 1	9	1050
		rep 2	7	1050
		rep 3	7	1060

MDC = minimum detectable concentration

Table 12 Elutriate TSS and Turbidity Measurements

Sample ID	TSS (mg/l)	TSS RPD (%)	Turbidity (NTU)
1-TOTB-A,B,C	0		6
1-TOTA	0		15.2
1-TOT-B	0		15.6
1-TOT-C	12		9.7
2-TOTB-A,B,C	0		5
2-TOT-A	13		31.9
2-TOT-A Duplicate	0	NC	--
2-TOT-B	0		25.7
2-TOT-C	6		23.8
3-TOTB-A,B,C	12		6.7
3-TOT-A	2		30.4
3-TOT-B	0		34.1
3-TOT-C	6		25.4
4-TOTB-A,B,C	4		9.7
4-TOT-A	16		102
4-TOT-B	0		90.7
4-TOT-C	534		115.1
4-TOT-C Duplicate	670	22.6	--
5-TOTB-A,B,C	0		1.5
5-TOT-A	30		89.2
5-TOT-B	18		76.8
5-TOT-C	14		75.7
6-TOTB-A,B,C	6		8.8
6-TOTB-A,B,C Duplicate	0	NC	--
6-TOT-A	12		77.9
6-TOT-B	18		87.3
6-TOT-C	30		67.9
7-TOTB-A,B,C	0		7.4
7-TOT-A	0		21.3
7-TOT-B	0		8.2
7-TOT-C	0		10.2
8-TOT-A	2		20.2
8-TOT-B	0		17.6
8-TOT-C	0		19.7
8-TOTB-A,B,C	0		6.1

3.4 Results of TCLP Analyses

All TCLP extractions were performed within 14 days of sample collection. TCLP extracts were analyzed for metals, volatile organics, semivolatile organics including PAHs, phenols, chlorinated phenols, PCBs, and chlorinated pesticides. Quality control samples included one replicate analysis and blank spike analyses. Due to the difficulty in filtering the extracts, preparation of sufficient extract volume for matrix spike analyses was prohibitive, therefore, blank spikes were used to assess accuracy. Only metals and selected volatile organics, phthalates and PAH compounds were detected in any of the extracts. Table 13

summarizes the results of detectable analytes in TCLP extracts by Reach. Results for all analyses of TCLP extracts are provided in Attachment E. Regulatory levels available for corresponding analytes are also presented in Table 13. No analytes were detected near or above the regulatory levels.

3.5 Results of Ambient and Elutriate Inorganic Analyses

3.5.1 Results of CN and Hexavalent Chromium

Results of cyanide (CN) and Hexavalent Chromium measurements in ambient waters are presented in Attachment F in the Philip Analytical data report. CN was detected at levels similar to those found in almost all of the procedural blanks with concentrations ranging from 0.002 to 0.003 mg/L. These concentrations were either at or just above the MDL (0.001 mg/L). Cr(VI) was detected in only a handful of samples at 0.003 mg/L, which was just slightly above the MDL of 0.002 mg/L.

3.5.2 Results of Metals

Table 14 presents the result of metals analyses for both ambient and elutriate samples. The highest levels of all metals were detected in the total and dissolved elutriate samples prepared from sediment collected in Reaches 4, 5 and 6. Cr, Pb and Sb were particularly elevated in total elutriate samples from these Reaches as compared to both the ambient waters and the dissolved ambient and elutriate samples (Reaches 5 and 6 only). These metals ranged from 10 times higher than the ambients for Pb and Cr to over 100 times higher for Sb. Ba was elevated in all dissolved and total elutriates as compared to the ambient waters due to the naturally occurring presence of Ba in marine sediments. Zn, on the other hand, was generally found at lower concentrations in the total elutriates compared to the ambient waters.

3.5.3 Methyl Mercury Results

Ambient methylmercury results are presented in Attachment G and elutriate methylmercury results are presented in Attachment F. Methylmercury was detected at similar low levels all ambient samples with concentrations ranging from 0.05 to 0.25 ng/L. MeHg was also detected in most elutriate samples with a somewhat larger range of concentrations, ranging from not detected at 0.02 ng/L to the highest concentrations of 0.3 ng/L in total elutriates prepared with sediment from Reaches 6 and 8.

Table 13 Summary of Detectable TCLP Results and Regulatory Criteria

Parameter	Unit	REACH 1	REACH 2	REACH 3	REACH 4	REACH 5 (2)	REACH 6	REACH 7	REACH 8	Regulatory Levels
METALS LEACHABLE										
Antimony Leachable	mg/L	0.03	0.03	0.02	0.14	0.1	0.15	< 0.02	< 0.02	
Arsenic Leachable	mg/L	0.1	0.14	< 0.04	0.14	0.18	0.11	0.07	0.07	5.0
Barium Leachable	mg/L	0.002	0.004	0.006	0.034	0.012	0.017	0.001	0.001	100
Beryllium Leachable	mg/L	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Boron Leachable	mg/L	0.2	0.25	0.19	0.35	0.23	0.13	< 0.04	0.06	
Cadmium Leachable	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	1.0
Chromium Leachable	mg/L	0.082	0.178	0.162	1.13	0.235	0.332	0.027	0.003	5.0
Cobalt Leachable	mg/L	< 0.004	< 0.004	< 0.004	0.004	< 0.004	< 0.004	< 0.004	< 0.004	
Copper Leachable	mg/L	0.078	0.128	0.068	0.128	0.129	0.126	0.048	0.012	
Iron Leachable	mg/L	0.98	1.01	1.19	3.18	2.85	2.13	0.26	0.24	
Lead Leachable	mg/L	0.05	0.09	0.04	0.14	0.14	0.22	< 0.03	< 0.03	5.0
Mercury Leachable	mg/L	0.00142	0.00032	0.00084	0.00242	0.00143	0.00084	0.00017	0.00045	0.20
Nickel Leachable	mg/L	< 0.01	0.01	0.02	0.03	0.01	0.02	< 0.01	< 0.01	
Selenium Leachable	mg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	1.0
Silver Leachable	mg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	5.0
Thallium Leachable	mg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Vanadium Leachable	mg/L	0.079	0.214	0.171	0.397	0.21	0.145	0.045	0.031	
Zinc Leachable	mg/L	0.04	0.04	0.05	0.11	0.1	0.14	0.03	0.05	
Zirconium Leachable	mg/L	< 0.003	0.005	0.004	0.012	0.005	0.003	< 0.003	< 0.003	
POLYCYCLIC AROMATIC HYDROCARBONS										
Benz(a)anthracene	mg/L	< 0.010 (1)	< 0.010 (1)	0.035	0.015	0.022	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	
Chrysene	mg/L	< 0.010 (1)	< 0.010 (1)	0.0035	0.014	0.026	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	
Benzo(b)fluoranthene	mg/L	< 0.010 (1)	< 0.010 (1)	0.016	< 0.010 (1)	0.019	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	
Benzo(k)fluoranthene	mg/L	< 0.010 (1)	< 0.010 (1)	0.018	< 0.010 (1)	0.012	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	
Pyrene	mg/L	< 0.010 (1)	< 0.010 (1)	0.16	0.063	0.073	0.044	0.014	0.023	
1-Methylnaphthalene	mg/L	< 0.010 (1)	< 0.010 (1)	0.18	0.06	< 0.010 (1)	0.2	0.13	0.39	
2-Methylnaphthalene	mg/L	< 0.010 (1)	< 0.010 (1)	0.11	0.021	< 0.010 (1)	0.046	< 0.010 (1)	0.36	
Acenaphthene	mg/L	< 0.010 (1)	< 0.010 (1)	0.19	0.06	0.017	0.098	0.079	0.15	
Acenaphthylene	mg/L	< 0.010 (1)	< 0.010 (1)	0.029	< 0.010 (1)	< 0.010 (1)	0.077	0.1	0.24	
Anthracene	mg/L	< 0.010 (1)	< 0.010 (1)	0.074	0.024	0.018	0.024	0.022	0.034	
Fluoranthene	mg/L	< 0.010 (1)	< 0.010 (1)	0.11	0.049	0.061	0.034	0.014	0.021	
Fluorene	mg/L	< 0.010 (1)	< 0.010 (1)	0.092	0.021	< 0.010 (1)	0.056	0.05	0.1	
Naphthalene	mg/L	< 0.010 (1)	< 0.010 (1)	0.27	0.065	< 0.010 (1)	0.035	0.11	0.47	
Phenanthrene	mg/L	0.012	< 0.010 (1)	0.27	0.12	0.048	0.13	0.1	0.19	
Total Low MW PAH's	mg/L	0.012	< 0.00001	0.93	0.29	0.083	0.42	0.46	1.2	
Total High MW PAH's	mg/L	< 0.00005	< 0.00005	0.37	0.15	0.23	0.078	0.028	0.044	
Total PAH's	mg/L	0.012	< 0.00005	1.3	0.44	0.31	0.5	0.49	1.2	
VOLATILE ORGANICS										
Dichloromethane	ug/L	26	17	21	25	23	22	16	5.5	
Chloroform	ug/L	2.8	4.4	5.6	5.6	5.5	0.8	3.9	5.8	6000
Toluene	ug/L	< 0.5	0.6	< 0.5	< 0.5	3.8	1.5	0.5	8.8	
Ethylbenzene	ug/L	< 0.5	< 0.5	6.1	5	< 0.5	42	12	86	
m,p - Xylene	ug/L	< 0.5	< 0.5	2.5	1.5	0.7	7.1	0.8	65	
o - Xylene	ug/L	< 0.5	< 0.5	4.2	3	0.5	14	5.9	41	
1,4-Dichlorobenzene	mg/L	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.010 (1)	0.43	< 0.0007	1	7.5
1,2-Dichlorobenzene	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.010 (1)	1.1	< 0.0008	< 0.0008	
SEMIVOLATILE ORGANICS										
Bis(2ethylhex)Phthal	mg/L	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	0.018	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	0.014	
Di-n-Butyl Phthalate	mg/L	< 0.010 (1)	< 0.010 (1)	0.074	0.036	< 0.010 (1)	0.034	0.017	0.021	
Di-n-Octyl Phthalate	mg/L	< 0.010 (1)	0.025	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	0.02	
Dibenzofuran	mg/L	< 0.010 (1)	< 0.010 (1)	0.013	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	< 0.010 (1)	0.028	

Result comments and/or text results :

(1) MDC raised due to low sample volume

(2) 2-propanone was tentatively ID'd; appears to be present at sig. Conc.

Table 14 Comparison of Ambient and Elutriate Metals Results

Metal	Rep: Units	Reach 1 Ambient Total			Reach 1 Elutriate Total Background			Reach 1 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	2.63	3.12	3.65	2.47	2.52	2.41	3.30	3.25	3.27
Be	ug/L	0.11 U	0.11 U	0.13	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	1640	1670	1610	1530	1540	1400	1340	1290	1260
Cr	ug/L	1.84	2.00	2.00	1.08	1.01	0.835	6.14	5.59	9.23
Ni	ug/L	6.85	6.97	7.15	9.44	9.26	9.60	10.5	10.2	10.0
Cu	ug/L	4.41	3.56	3.90	3.79	3.68	3.73	4.19	4.04	4.33
Zn	ug/L	18.1	17.4	16.6	5.71	6.47	9.17	5.76	5.75	6.41
Se	ug/L	2.04	2.58	3.06	2.41	1.67	1.60	1.87	1.92	1.97
Ag	ug/L	0.783	0.764	0.702	0.0256	0.0914	0.0443	0.0438	0.0371	0.0489
Cd	ug/L	0.148	0.145	0.0815	0.278	0.242	0.280	0.117	0.125	0.110
Sb	ug/L	0.584	0.502	0.528	0.257	0.633	0.394	7.58	7.75	4.28
Ba	ug/L	8.21	5.45	7.13	8.68	9.00	8.87	19.0	18.6	17.0
Tl	ug/L	0.0146	0.0103	0.0202	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.953	0.768	0.706	0.686	0.707	0.645	3.99	3.61	5.36
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Metal	Rep: Units	Reach 2 Ambient Total			Reach 2 Elutriate Total Background			Reach 2 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	1.57	3.01	1.92	1.85	1.82	2.08	9.55	6.17	5.95
Be	ug/L	0.11 U	0.11 U	0.11 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	1470	1460	1430	1130	1120	1120	1060	1100	1090
Cr	ug/L	1.76	1.77	2.33	0.745	0.698	0.699	2.69	2.36	2.64
Ni	ug/L	5.29	5.75	5.73	7.61	7.61	7.43	7.93	8.11	8.15
Cu	ug/L	3.11	3.35	3.41	3.53	3.49	3.88	2.96	2.98	2.96
Zn	ug/L	5.62	6.71	6.93	11.5	10.5	10.4	4.53	3.18	3.83
Se	ug/L	1.47	3.38	1.56	1.22	0.762	1.26	2.07	2.00	1.69
Ag	ug/L	1.04	0.808	0.761	0.0371	0.0253	0.0250	0.0327	0.0205	0.0241
Cd	ug/L	0.574	0.480	0.624	0.275	0.282	0.252	0.101	0.0803	0.0799
Sb	ug/L	0.794	0.742	0.635	0.291	0.285	0.248	6.84	3.58	2.97
Ba	ug/L	6.49	9.19	6.61	8.87	8.34	8.80	19.0	16.8	15.6
Tl	ug/L	0.0287	0.0220	0.0175	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	2.98	2.91	2.90	0.973	1.05	1.07	2.20	1.67	1.83
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 14 (cont.)

Metal	Rep: Units	Reach 3 Ambient Total			Reach 3 Elutriate Total Background			Reach 3 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	2.07	2.61	3.43	2.04	2.50	2.78	10.2	10.6	7.43
Be	ug/L	0.11 U	0.11 U	0.11 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	1280	1250	1240	1290	1300	1280	1390	1420	1400
Cr	ug/L	2.03	2.04	2.12	1.80	1.83	2.10	3.62	3.76	4.77
Ni	ug/L	9.16	9.23	9.46	9.36	9.73	9.75	8.77	9.22	9.20
Cu	ug/L	3.95	4.13	4.10	3.74	3.73	4.00	3.26	3.36	3.43
Zn	ug/L	4.40	3.36	3.41	13.8	12.6	13.4	5.08	5.09	5.05
Se	ug/L	2.93	2.77	2.95	0.855	1.17	1.65	2.22	2.63	3.18
Ag	ug/L	0.0614	0.0299	0.0237	0.0225	0.0278	0.0486	0.0338	0.0285	0.0277
Cd	ug/L	0.263	0.227	0.224	0.104	0.0868	0.112	0.119	0.120	0.116
Sb	ug/L	0.529	0.304	0.270	0.286	0.264	0.277	6.10	5.33	5.55
Ba	ug/L	7.88	7.81	7.78	7.74	8.45	8.28	29.6	31.1	32.6
Tl	ug/L	0.0174	0.0130	0.0136	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.517	0.491	0.518	1.10	1.09	1.09	2.52	2.86	3.18
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Metal	Rep: Units	Reach 4 Ambient Total			Reach 4 Elutriate Total Background			Reach 4 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	3.40	3.48	4.05	2.56	2.65	2.58	18.3	16.2	14.0
Be	ug/L	0.11 U	0.11 U	0.11 U	0.09 U	0.09 U	0.09 U	0.0960	0.09 U	0.09 U
B	ug/L	1210	1160	1170	1320	1330	1320	1300	1340	1370
Cr	ug/L	2.54	2.56	2.60	1.72	1.88	1.99	40.9	31.4	25.9
Ni	ug/L	8.42	8.38	8.44	7.09	7.08	7.35	8.38	8.21	7.91
Cu	ug/L	3.67	3.74	3.82	3.11	3.20	3.33	6.44	5.59	4.86
Zn	ug/L	7.55	7.19	7.73	7.07	7.29	7.17	20.6	14.0	12.2
Se	ug/L	3.09	2.98	4.27	2.46	2.62	2.67	2.93	2.53	3.05
Ag	ug/L	0.0627	0.0346	0.0289	0.0254	0.0246	0.0224	0.0820	0.0652	0.0596
Cd	ug/L	0.103	0.0903	0.0980	0.0803	0.0749	0.108	0.234	0.206	0.202
Sb	ug/L	0.524	0.344	0.263	0.475	0.319	0.276	163	163	170
Ba	ug/L	8.34	8.43	8.27	8.97	8.86	9.03	62.5	62.6	63.0
Tl	ug/L	0.0171	0.0148	0.0160	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	1.15	1.10	1.09	0.986	0.941	1.00	15.9	12.8	11.1
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.20	0.2 U	0.2 U	0.2 U

Table 14 (cont.)

Metal	Rep: Units	Reach 5 Ambient Dissolved			Reach 5 Ambient Total			Reach 5 Elutriate Dissolved Background		
		A	B	C	A	B	C	A	B	C
As	ug/L	1.51	1.46	1.47	2.06	2.93	2.96	1.20	1.68	1.59
Be	ug/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.09 U	0.09 U	0.09 U
B	ug/L	861	804	814	896	881	863	860	854	849
Cr	ug/L	0.450	0.437	0.425	4.03	4.20	4.42	0.100	0.220	0.190
Ni	ug/L	5.29	4.92	5.11	6.09	6.04	6.19	5.51	5.57	5.88
Cu	ug/L	2.34	2.22	2.33	3.51	3.53	3.57	2.32	2.26	2.39
Zn	ug/L	3.00	2.78	2.69	45.0	44.9	45.1	17.9	23.9	18.2
Se	ug/L	2.34	2.89	2.81	1.60	2.43	2.49	0.914	1.33	1.14
Ag	ug/L	0.0389	0.0252	0.0200	0.0522	0.0393	0.0341	0.0148	0.0153	0.0131
Cd	ug/L	0.0712	0.0589	0.0642	0.115	0.0889	0.0915	0.0762	0.0676	0.0688
Sb	ug/L	0.486	0.281	0.230	0.390	0.272	0.223	0.239	0.200	0.210
Ba	ug/L	7.16	6.62	6.70	8.48	8.37	8.36	7.82	7.83	7.70
Tl	ug/L	0.00975	0.00910	0.00818	0.0135	0.0141	0.0140	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.0842	0.0663	0.0720	1.68	1.61	1.61	0.167	0.148	0.174
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Metal	Rep: Units	Reach 5 Elutriate Dissolved			Reach 5 Elutriate Total Background			Reach 5 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	9.91	6.33	7.22	2.23	2.23	2.31	11.3	9.50	7.16
Be	ug/L	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	875	843	923	1260	1240	1300	1540	1580	899
Cr	ug/L	1.03	0.908	0.968	2.21	2.18	2.07	6.57	6.66	5.53
Ni	ug/L	4.93	4.72	5.56	4.58	4.70	4.80	5.09	5.52	5.74
Cu	ug/L	1.64	1.62	2.30	2.78	2.94	2.96	4.17	4.20	3.50
Zn	ug/L	8.65	10.7	56.5	10.6	11.7	11.6	13.9	15.6	12.4
Se	ug/L	1.91	1.23	1.31	2.10	1.93	2.03	1.27	1.26	1.35
Ag	ug/L	0.0285	0.0189	0.0252	0.0278	0.0265	0.0255	0.0467	0.0461	0.0682
Cd	ug/L	0.105	0.098	0.132	0.0817	0.0854	0.0724	0.251	0.262	0.192
Sb	ug/L	106	104	106	0.310	0.259	0.242	101	115	104
Ba	ug/L	23.1	21.8	24.8	8.33	7.94	8.09	30.4	31.4	30.9
Tl	ug/L	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.890	0.679	0.824	1.18	1.19	1.18	13.5	13.2	11.1
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 14 (cont.)

Metal	Rep: Units	Reach 6 Ambient Dissolved			Reach 6 Ambient Total			Reach 6 Elutriate Dissolved Background		
		A	B	C	A	B	C	A	B	C
As	ug/L	1.23	1.24	1.12	1.21	2.25	1.27	1.24	1.25	1.19
Be	ug/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.09 U	0.09 U	0.09 U
B	ug/L	669	685	682	706	682	674	1070	1170	1180
Cr	ug/L	0.373	0.392	0.377	2.18	2.22	2.36	0.569	0.454	0.405
Ni	ug/L	4.00	4.31	4.38	6.75	6.05	5.98	4.21	4.05	3.85
Cu	ug/L	1.82	1.94	1.96	2.42	2.45	2.51	2.15	2.03	1.76
Zn	ug/L	3.76	4.08	3.86	5.88	5.70	5.76	26.5	21.9	16.5
Se	ug/L	1.93	2.08	1.87	0.889	1.79	0.901	1.24	1.29	1.08
Ag	ug/L	0.0342	0.0208	0.0185	0.0349	0.0302	0.0240	0.0174	0.0170	0.0124
Cd	ug/L	0.0733	0.0591	0.0679	0.0697	0.0775	0.0577	0.133	0.111	0.0783
Sb	ug/L	0.567	0.330	0.257	0.236	0.213	0.183	0.184	0.172	0.166
Ba	ug/L	7.20	7.49	7.23	8.13	7.96	7.92	7.81	8.00	7.74
Tl	ug/L	0.0127	0.0102	0.00944	0.0113	0.0113	0.0123	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.102	0.0919	0.0958	0.942	0.909	0.889	0.522	0.460	0.318
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Metal	Rep: Units	Reach 6 Elutriate Dissolved			Reach 6 Elutriate Total Background			Reach 6 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	9.88	8.46	9.65	2.16	2.18	2.13	7.43	7.20	7.82
Be	ug/L	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	1270	1250	1230	1260	1090	1070	1300	1250	1280
Cr	ug/L	0.748	0.557	0.725	2.81	2.59	2.50	15.1	14.2	12.1
Ni	ug/L	4.04	3.59	3.72	3.55	3.63	3.54	4.37	4.46	4.55
Cu	ug/L	1.49	1.49	1.51	2.47	2.34	2.37	4.26	4.18	4.18
Zn	ug/L	19.3	62.7	17.6	23.5	22.7	22.6	15.5	15.2	15.5
Se	ug/L	0.787	1.19	0.975	1.50	1.21	1.65	1.37	1.45	0.6 U
Ag	ug/L	0.0156	0.0135	0.00856	0.0494	0.0306	0.0284	0.0527	0.0461	0.0453
Cd	ug/L	0.0619	0.0478	0.0604	0.0805	0.0641	0.0538	0.178	0.187	0.161
Sb	ug/L	79.2	67.8	76.4	0.674	0.434	0.336	76.3	65.2	75.7
Ba	ug/L	42.8	42.1	43.8	8.95	8.86	8.57	55.2	53.8	56.1
Tl	ug/L	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.0354	0.03 U	0.03 U
Pb	ug/L	1.03	1.26	1.20	1.52	1.49	1.38	17.0	16.5	16.6
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 14 (cont.)

Metal	Rep: Units	Reach 7 Ambient Dissolved			Reach 7 Ambient Total			Reach 7 Elutriate Dissolved Background		
		A	B	C	A	B	C	A	B	C
As	ug/L	0.707	0.758	0.711	1.17	1.56	1.07	1.13	1.10	1.04
Be	ug/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11	0.11 U	0.09 U	0.09 U	0.09 U
B	ug/L	235	228	229	248	239	241	367	374	368
Cr	ug/L	0.286	0.300	0.290	1.99	2.19	2.19	0.666	0.526	0.654
Ni	ug/L	1.66	1.56	1.57	2.70	2.74	2.59	1.69	1.75	1.75
Cu	ug/L	0.950	0.937	0.943	1.93	1.89	1.87	0.989	1.05	1.07
Zn	ug/L	10.4	10.1	10.0	9.71	9.20	9.72	31.5	36.3	56.4
Se	ug/L	0.521	0.567	0.565	0.541	0.489	0.380	0.6 U	0.612	0.6 U
Ag	ug/L	0.0167	0.0114	0.0205	0.0226	0.0231	0.0225	0.00676	0.00757	0.00808
Cd	ug/L	0.0402	0.0300	0.0257	0.200	0.247	0.239	0.0732	0.0649	0.0532
Sb	ug/L	0.124	0.135	0.215	0.122	0.107	0.113	0.128	0.113	0.121
Ba	ug/L	7.31	7.31	7.27	8.61	8.41	8.49	8.44	8.41	8.48
Tl	ug/L	0.00800	0.00845	0.00864	0.0107	0.0106	0.0112	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.131	0.108	0.112	1.51	1.45	1.46	0.422	0.335	0.809
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.29	0.2 U	0.2 U

Metal	Rep: Units	Reach 7 Elutriate Dissolved			Reach 7 Elutriate Total Background			Reach 7 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	2.63	3.67	4.21	1.290	1.250	1.360	2.96	3.93	3.69
Be	ug/L	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	538	597	566	503	502	520	533	613	566
Cr	ug/L	0.139	0.209	0.283	1.20	1.33	1.54	1.76	0.990	0.854
Ni	ug/L	3.36	3.36	3.13	1.90	1.99	1.92	3.82	3.52	3.40
Cu	ug/L	1.01	1.25	1.09	2.21	1.97	2.02	1.53	1.13	1.21
Zn	ug/L	20.4	30.4	35.3	23.8	22.9	22.9	4.51	4.76	3.94
Se	ug/L	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Ag	ug/L	0.006	0.00693	0.0162	0.0147	0.0153	0.0155	0.0171	0.0120	0.00980
Cd	ug/L	0.02	0.0306	0.0300	0.0519	0.0521	0.0516	0.0245	0.0220	0.0256
Sb	ug/L	1.67	3.64	3.75	0.127	0.122	0.117	1.52	3.56	3.61
Ba	ug/L	40.7	54.9	53.4	8.76	8.76	8.93	45.6	59.0	55.4
Tl	ug/L	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.171	0.179	0.210	1.45	1.53	1.59	1.54	0.822	0.880
Hg	ug/L	0.22	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 14 (cont.)

Metal	Rep: Units	Reach 8 Ambient Total			Reach 8 Elutriate Total Background			Reach 8 Elutriate Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	1.04	1.19	0.670	2.08	1.97	1.33	2.04	1.83	2.16
Be	ug/L	0.11 U	0.11 U	0.11 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
B	ug/L	307	305	299	673	679	683	668	711	747
Cr	ug/L	1.02	1.07	1.06	1.47	1.50	1.74	1.56	1.53	1.50
Ni	ug/L	3.12	2.99	3.03	3.18	3.26	3.28	4.27	4.36	4.82
Cu	ug/L	1.61	1.62	1.55	2.25	2.86	2.25	3.38	3.11	3.24
Zn	ug/L	49.9	50.0	48.9	24.0	27.7	23.5	14.4	10.4	10.7
Se	ug/L	0.551	0.619	0.521	0.6 U	0.694	0.761	0.6 U	0.690	0.622
Ag	ug/L	0.0453	0.0273	0.0222	0.0188	0.0168	0.0158	0.0489	0.0272	0.0239
Cd	ug/L	0.0297	0.0437	0.0527	0.0500	0.0478	0.0580	0.0972	0.103	0.0730
Sb	ug/L	0.254	0.195	0.167	0.257	0.269	0.264	6.83	7.29	7.48
Ba	ug/L	8.59	8.31	8.26	8.86	8.87	9.12	23.1	24.6	25.7
Tl	ug/L	0.0108	0.00908	0.00957	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pb	ug/L	0.887	0.866	0.802	1.63	1.59	1.77	11.2	11.0	12.1
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Metal	Rep: Units	Disposal Site - Near Ambient Total			Disposal Site - Near Ambient Dissolved		
		A	B	C	A	B	C
As	ug/L	1.86	0.814	1.50	0.664	0.728	0.700
Be	ug/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
B	ug/L	569	563	565	568	588	603
Cr	ug/L	1.09	1.22	0.983	0.453	0.462	0.470
Ni	ug/L	3.96	3.91	3.98	3.45	3.79	3.88
Cu	ug/L	2.31	2.26	2.35	1.83	1.90	1.89
Zn	ug/L	5.50	4.68	4.71	3.17	3.51	3.56
Se	ug/L	1.83	0.880	1.40	1.01	1.29	1.29
Ag	ug/L	0.0162	0.0135	0.0146	0.0110	0.0133	0.0139
Cd	ug/L	0.0909	0.104	0.0866	0.0546	0.0555	0.0445
Sb	ug/L	0.147	0.147	0.143	0.162	0.161	0.160
Ba	ug/L	8.05	8.05	8.02	6.88	7.37	7.45
Tl	ug/L	0.00891	0.00959	0.00952	0.00745	0.00656	0.00825
Pb	ug/L	0.460	0.448	0.494	0.0768	0.0771	0.0794
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 14 (cont.)

Metal	Rep: Units	Disposal Site - Down Ambient Total			Disposal Site - Up Ambient Total			Field Blank Ambient Total		
		A	B	C	A	B	C	A	B	C
As	ug/L	2.27	1.35	1.38	1.05	0.891	1.29	0.13 U	0.13 U	0.13 U
Be	ug/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
B	ug/L	574	558	557	407	402	400	2.6 U	2.6 U	2.6 U
Cr	ug/L	1.08	1.09	1.06	0.925	0.962	0.964	0.119	0.149	0.108
Ni	ug/L	4.28	4.47	4.26	2.72	2.66	2.66	0.04 U	0.04 U	0.04 U
Cu	ug/L	2.32	2.28	2.36	1.78	1.74	1.67	0.033	0.025	0.009
Zn	ug/L	6.46	6.69	6.39	5.50	5.26	5.06	3.41	3.27	3.28
Se	ug/L	1.59	1.28	1.21	0.483	0.556	0.802	0.3 U	0.3 U	0.3 U
Ag	ug/L	0.0176	0.0168	0.0174	0.0146	0.0147	0.0133	0.0669	0.0631	0.0589
Cd	ug/L	1.28	1.17	1.25	0.0717	0.0763	0.0645	0.01 U	0.01 U	0.01 U
Sb	ug/L	0.205	0.177	0.157	0.119	0.138	0.121	0.145	0.0995	0.0755
Ba	ug/L	8.08	7.99	7.89	7.85	7.60	7.71	0.068 U	0.068 U	0.068
Tl	ug/L	0.00909	0.00960	0.00936	0.00782	0.00812	0.00701	0.006 U	0.006 U	0.006 U
Pb	ug/L	0.647	0.640	0.647	0.672	0.682	0.707	0.0395	0.0384	0.0382
Hg	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

3.6 Results of Ambient and Elutriate Organic Analyses

3.6.1 Results of Total Petroleum Hydrocarbons

Results for all TPH analyses along with QA/QC results and a narrative detailing any quality control issues are provided in Attachments F (ambient water) and G (elutriates). Table 15 provides a summary of these results. Elutriate TPH values were higher than ambient concentrations for all Reaches. The highest TPH values were measured in total elutriates prepared from sediment collected in Reach 8 with concentrations near 5000 µg/L. Elevated TPH levels, relative to ambient water concentrations, were also observed in elutriates from Reaches 3 through 7.

3.6.2 Results of Semivolatile Organic Analyses

Results for all semivolatile analyses along with QA/QC results and a narrative detailing any quality control issues are provided in Attachments F (ambient water) and G (elutriates). The only compounds detected in ambient waters were selected phthalates and some of the more volatile PAHs including primarily naphthalene in concentrations ranging from not detected at about 20 ng/L at most locations to 100-200 ng/L in waters collected near the disposal site and Reaches 3 and 6.

Phthalates were also detected in elutriates, though, in general, concentrations were in the range detected in the ambient waters. Phthalates are fairly ubiquitous substances and can often be introduced as laboratory contaminants. The procedural blanks measured with the samples showed some levels of bis(2-ethylhexyl)phthalate at around 100 ng/L. In general, phthalate levels were above the concentrations found in the blanks and often other phthalate compounds were detected in the samples, which most likely indicates that laboratory contamination was not the primary source of phthalates.

Substantially higher levels of all PAH compounds were detected in elutriates, both total and dissolved. Table 16 provides a summary of the total low and high molecular weight PAHs and Total PAHs presented in units of $\mu\text{g/L}$, to more easily compare results between Reaches. Ambient water results were not presented in this summary since ambient water concentrations of PAHs were generally below 100 ng/L (or $<1 \mu\text{g/L}$ as presented in the table). Note that original results presented in Attachment's F and G are reported in ng/L .

The highest total PAH concentrations were found in elutriates prepared from sediment collected in Reaches 3 and 8. However, it is interesting to note that the ratio of low and high molecular weight PAH compounds differs among samples. Reach 4 elutriate has roughly equal concentrations of total low and high molecular weight PAH compounds, whereas, elutriates from most of the other Reaches show a higher proportion of the low molecular weight PAHs. This indicates that the sources and composition of the hydrocarbons are most likely different in the various Reaches.

3.6.3 Results of PCBs and Chlorinated Pesticide Analyses

Results for all PCB and pesticide analyses along with QA/QC results and a narrative detailing any quality control issues are provided in Attachments F (ambient water) and G (elutriates). PCBs were not detected above the MDLs in any ambient or elutriate samples. The only chlorinated pesticides detected and confirmed were g-BHC in ambient waters from Reaches 4 through 8 and dieldrin in ambient waters from water collected nearest the disposal site. Endosulfan was the only compound detected and confirmed in any of the elutriate samples and was found at an average concentration of about 15 ng/L in total elutriate prepared from sediment collected in Reach 6.

3.6.4 Results of Volatile Organic Analyses

Volatile organics were only measured in ambient total site water samples (since the process filtering site waters can result in the loss of volatiles and the elutriates preparation includes which also results in the loss of the any volatile sediment components). Sample results as well as QA/QC results and a narrative detailing any quality control issues, are provided in Attachment F. Low levels of common laboratory contaminants, methylene chloride and acetone, were detected in most samples and in the corresponding method blanks. Low levels of toluene, ethylbenzene and xylenes were detected in samples collected from Reaches 7 and 8 and water collected nearest the disposal site, however, most of these values were at or below detection limits ranging from 0.5 to 1 $\mu\text{g/L}$. Chlorobenzenes were also detected at low concentrations in the sample collected from Reaches 6 and slightly higher levels in the sample from Reach 7.

3.6.5 Results of Miscellaneous Organic Compounds

Results for all miscellaneous organic compounds, including herbicides, carbamate pesticides, endothall, ethylene glycol and atrazine and simazine, along with QA/QC results are provided in Attachments F (ambient water) and G (elutriates). None of these compounds were detected above the minimum detectable concentration in any of the samples.

4.0 CONCLUSIONS

Overall, the results from sediment, site water and ambient water chemical analyses indicates that the predominant contaminants of concern in the Cochemo River are petroleum hydrocarbons and possibly a few trace metals including Cr, Pb and Sb. Few compounds were detected in analyses of actual site

waters, however, levels in elutriate waters prepared from sediments collected in discrete Reaches of the River were elevated. Also, the distribution of low and high molecular weight PAHs in the elutriate samples from each Reach differed, indicating that the source and composition of the hydrocarbons varied along the portion of the river studied.

Table 15 Summary of TPH Results for Total and Dissolved Ambient Waters and Elutriates

TOTAL TPH (µg/L)								
AMBIENT					ELUTRIATE			
Rep:	A	B	C	RSD %	A	B	C	RSD %
REACH								
1	500U	500U	500U	NA	738	768	642	9.2
2	500U	500U	500U	NA	500U	500U	500U	24.2
3	528	440 J	492 J	NA	3415	3049	2327	18.9
4	500U	500U	500U	NA	2956	2801	2532	7.8
5	500U	500U	500U	NA	1999	1891	1620	10.6
6	500U	500U	500U	NA	2879	2412	2639	8.8
7	500U	500U	500U	NA	1520	1743	1790	8.6
8	500U	500U	500U	NA	5135	5036	5669	6.5
Disposal - Down	538	500U	600	NA	NA	NA	NA	NA
Disposal - Up	500U	500U	500U	NA	NA	NA	NA	NA
Disposal - Near	500U	500U	500U	NA	NA	NA	NA	NA
DISSOLVED TPH (µg/L)								
	AMBIENT				ELUTRIATE			
Rep:	A	B	C	RSD	A	B	C	RSD%
REACH								
5	500U	500U	500U	NA	1118	1106	128	72.5&
6	500U	500U	500U	NA	2174	2492	2192	7.8
7	500U	500U	500U	NA	1698	1694	1700	0.2
Disposal - Near	500U	500U	500U	NA	NA	NA	NA	NA
Procedural Blanks	AMBIENT		ELUTRIATE					
1	500U		500U		U indicates not detected at or ab J indicates detected below the D NA indicates not applicable			
2	500U		500U					
3	500U		500U					

Table 16 Summary of Low and High Molecular Weight and Total PAHs in Elutriates in $\mu\text{g/L}$ (1)

Reach	Test	Type	Unit	Rep	LMWPAH	HMWPAH	Total PAH
Reach 1	Elutriate	Total	$\mu\text{g/L}$	A	1.6	8.9	10.5
				B	1.2	8.1	9.3
				C	0.5	0.6	1.1
Reach 2	Elutriate	Total	$\mu\text{g/L}$	A	0.4	4.4	4.8
				B	0.4	5.1	5.5
				C	0.3	5.0	5.3
Reach 3	Elutriate	Total	$\mu\text{g/L}$	A	1003.9	36.1	1040.1
				B	1169.7	34.4	1204.2
				C	252.1	38.1	290.2
Reach 4	Elutriate	Total	$\mu\text{g/L}$	A	245.9	112.9	358.9
				B	242.1	106.3	348.4
				C	215.1	63.7	278.8
Reach 5	Elutriate	Dissolved	$\mu\text{g/L}$	A	15.2	9.1	24.3
				B	15.0	9.0	24.1
				C	17.4	9.9	27.3
Reach 5	Elutriate	Total	$\mu\text{g/L}$	A	23.3	27.1	50.4
				B	19.5	22.6	42.1
				C	20.8	22.7	43.5
Reach 6	Elutriate	Dissolved	$\mu\text{g/L}$	A	263.0	24.8	287.8
				B	282.9	24.9	307.9
				C	280.4	25.7	306.0
Reach 6	Elutriate	Total	$\mu\text{g/L}$	A	295.8	51.6	347.4
				B	245.5	44.6	290.1
				C	273.3	51.0	324.3
Reach 7	Elutriate	Dissolved	$\mu\text{g/L}$	A	292.9	13.9	306.8
				B	357.8	16.1	373.9
				C	315.5	14.4	329.9
Reach 7	Elutriate	Total	$\mu\text{g/L}$	A	304.2	16.8	320.9
				B	219.8	10.2	230.0
				C	366.2	16.7	382.8
Reach 8	Elutriate	Total	$\mu\text{g/L}$	A	1378.6	33.7	1412.3
				B	1459.8	32.7	1492.5
				C	1673.1	33.9	1706.9

(1) Ambient Results are not shown because all values are less than $0.1 \mu\text{g/L}$, with the exception of naphthalene in a few samples. Also, all background dissolved samples were also not detected above $0.10.1 \mu\text{g/L}$.

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SECTION 02328

UNDERWATER DRILLING AND BLASTING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety and Health Requirements Manual

1.2 MEASUREMENT AND PAYMENT

Measurement and payment for rock material removal and disposal is specified in Section 02325 DREDGING and Section 01270 MEASUREMENT AND PAYMENT.

1.3 DEFINITIONS

Rock: Hard, dense (over 2 tons/cubic yard) material which cannot be removed without drilling and blasting or hoe ram percussive methods.

1.4 PERFORMANCE REQUIREMENTS

1.4.1 Responsibilities

1.4.1.1 General

The Contractor's blasting program and methods shall be those necessary to accomplish the rock excavation shown on the contract drawings in accordance with the procedures specified in this section. The Contractor will be required to make necessary plans, examinations, surveys, and test blasts to determine the quantity of explosives that can be fired without damaging property, and to thereafter control the quantity of explosives fired in any one blast to prevent injuries to persons or damage to structures, homes, utilities, vehicles, vessels moored or underway, or to property.

1.4.2 Coordination

1.4.2.1 Schedules

Schedules for blasting shall be thoroughly coordinated with the proper authorities; Federal, State, and local. No blasting shall be performed unless the Contractor is notified by all concerned parties that he may blast.

1.4.2.2 Permits

The Contractor will be required to obtain all necessary permits from the

local authorities to perform blasting operations. The Contracting Officer shall be notified in writing that all permits have been obtained.

1.4.2.3 Fisheries Biologist

The Corps of Engineers will provide a fisheries biologist to monitor fish runs and report on any possible fish kills from the blasting operations. The Contractor shall cooperate with the biologist in his observations and collection of any dead fish.

1.4.3 Work Restrictions

1.4.3.1 Allowable Blasting Dates

Blasting for rock removal is restricted to the time frame of 15 November 2005 to 15 December 2005, inclusive. Blasting shall not be performed at any other time. Rock removal using methods that do not involve blasting, e.g., hoe ram percussion methods, may be performed at any time within the dredging season.

1.4.3.2 Protection of Finfish

To reduce impacts to finfish, the Contractor shall comply with the following restrictions:

- (1) No blasting will be permitted during periods of dead slack water consistent with safety requirements.
- (2) The Contracting Officer may temporarily stop blasting operations in the event that a peak fish run is detected in the vicinity or appears imminent.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Blasting Protection plan

Prior to blasting, submit a plan for protection of surrounding structures, equipment, and vessels. Acceptance of the plan by the Contracting Officer will not relieve the Contractor of the responsibility for producing safe and satisfactory results.

1.6 QUALITY CONTROL

1.6.1 Qualifications

The Contractor shall employ a specialist qualified in vibration control methods and who is capable of analyzing results obtained from seismograph readings. A minimum of 30 days prior to commencement of blasting operations, the Contractor shall provide the Contracting Officer with bona fides of the seismic specialist to include but not limited to past experience, training, and education. The acceptability of the specialist

is subject to the approval of the Contracting Officer. The Contractor shall provide a minimum of three seismographs to measure and record ground movements caused by each blast detonated under the contract. Seismograph operators shall be qualified personnel capable of setting up instruments at designated locations and efficiently recording the blast.

1.6.2 Blasting Safety Plan

No later than seven days after receipt of Notice to Proceed, the Contractor shall submit to the Contracting Officer four copies of the Test Blasting Plan for review and acceptance. The Contracting Officer shall have 14 days for review and acceptance after receipt by the Contracting Officer's Representative. If the plan is not acceptable, the Contractor shall revise and resubmit the plan. The Contracting Officer shall have seven days for review and acceptance of the revised plan.

The Contractor shall also submit a weekly blasting operation schedule to the Contracting Officer to facilitate the Corps' monitoring of the effects of blasting operations on the fishery resource. This schedule shall be provided by Wednesday of the week before the blasting is to occur. The schedule shall include, as a minimum, the days blasting that will occur and the areas to be blasted.

No blasting shall be started until after the Blasting Safety Plan has been reviewed and accepted by the Contracting Officer.

In addition to the requirements of EM 385-1-1, Section 29, the Contractor's Blasting Plan shall include, as a minimum, the following items:

- (1) Proposed method of transportation, storage, and handling of explosives.
- (2) Procedure for monitoring the blast operations and handling misfires.
- (3) Location, size, depth, and spacing of blast holes, type of explosive and method of loading and detonating, and maximum number of holes to be detonated per blast. Type of blasting machine to be used and when last tested.
- (4) Type of instrumentation to be used, manufacturer, and when last calibrated and/or certified.
- (5) List of licenses, permits, and/or clearances required, when applied for, and date of approval or anticipated approval by Federal, State, and local concerns.
- (6) A format for maintaining a record of individual blasts (i.e. the "Daily Blasting Log") throughout the life of the project designed to record pertinent data before, during, and after the blasting operation. Pertinent information shall include, but not be limited to, those items specified in paragraph "Daily Blasting Log".
- (7) Names and qualifications of specialists for vibration control analysis and airblast over-pressure measurements, see paragraph "Qualifications". Names and addresses of all certified blasters and users.
- (8) Plan showing location of warning signs and signals to be used.

Method of controlling vessel traffic and communications, if applicable.

(9) Name and address of Contractor's representative to which any claims for damage due to blasting should be addressed.

(10) A test plan which encompasses the requirements of the Test Blast Program specified below. This plan shall also include the planned test patterns and weights of explosives of each test blast with anticipated peak particle velocities and peak positive airblast pressures at structures most likely to receive damage from the test blast.

(11) The plan shall be signed off by the Contractor's "Contractor Quality Control System Manager".

1.7 LIGHTNING PROTECTION

The Contractor shall furnish, maintain, and operate lightning-detection equipment during the entire period of blasting operations and/or during the periods that explosives are stored at the site. The equipment shall be "Litton TSM/C Thunderstorm Monitor and Lightning Warning Instrument", as manufactured by Litton Industries, Inc., Environmental Systems Division, Camarillo, California, or approved equal. The equipment shall be installed in accordance with the manufacturers written instructions. When the lightning-detection device indicates a blasting hazard potential, personnel shall be evacuated from all areas where explosives are present.

1.8 RECORDKEEPING

1.8.1 Daily Explosive Material Summary

The Contractor shall keep a daily record of transactions, to be maintained at each storage magazine. The inventory records shall be updated at close of business each day. Records shall show class and quantities received and issued, and total remaining on hand at end of each day. The remaining stock shall be checked each day, and any discrepancies that would indicate a theft or loss of explosive material shall be reported immediately.

1.8.2 Report of Loss

Should a loss or theft of explosives occur, all circumstances and details of the loss/theft will be immediately reported to the nearest office of the ATF, as well as to the local law enforcement authorities and the Contracting Officer's Representative.

1.8.3 Licenses

The Contractor shall provide the Contracting Officer with a list of Contractor's blasting license holders, and only these personnel shall be permitted to handle explosives and conduct blasting operations.

1.8.4 Daily Blasting Log

The Contractor shall provide the Contracting Officer, on a weekly basis, a daily log of blasting operations. The log shall be updated at close of business each day. The log shall include the number of blasts; time and date of blast; the blast locations and patterns; the pounds of explosive used per hole; average water and substrate depth; millisecond delays used; the drill tip elevation at the top of bedrock for each hole drilled as recorded by the Contractor under the direction of the Contracting Officer's

representative; and the occurrence of any fish kills.

1.9 DELIVERY, STORAGE, AND HANDLING

1.9.1 Safety

The Contractor shall take all reasonable precautions for the protection of individuals and property exposed to his operations. Such precautions shall include, but are not limited to:

- (1) The amount of explosives permitted aboard the plant at one time will be subject to the approval of the Contracting Officer, but in no case shall such amount exceed that required by the Contractor for one day's operations.
- (2) Provision shall be made for jettisoning explosives in emergencies. It shall be the Contractor's responsibility for retrieving the same after the emergency is over.
- (3) The Contractor shall take all necessary precautions to prevent damage to any vessel (moored or underway), structures or property, and preserve the crew or occupants thereof from exposure to injury as a result of his operations.
- (4) In order to prevent flyrock damage, blasting mats shall be employed unless four or more feet of water overlies the rock surface.
- (5) The Contractor shall look out for and take all precautions necessary to warn and/or protect swimmers, divers, or other individuals in the water exposed to his operations prior to blasting.
- (6) Transport of explosives and detonators shall be in vehicles suitably grounded and protected from lightning strikes and electrical storm phenomena, in accordance with Federal and State requirements.
- (7) No explosive material shall be handled, transported, or in any way made use of during any period of electrical storms, of lightning, or other electrical phenomenon. In the event that any such condition should appear eminent or occur, or if some known leakage of electricity should occur in the neighborhood of or in the work area, while the transport, handling, making up, charging, or such like use of explosives is being effected, then the work area shall be evacuated and abandoned completely until at least 30 minutes after the condition has ceased or the leakage stopped. The Contracting Officer shall be notified prior to any blasting or loading operation so that stationary or mobile radio transmission are not made on the site.
- (8) The handling, storage, and use of explosives shall be governed by the applicable provisions of the section on "Blasting" of EM 385-1-1. In addition, the Contractor shall make necessary arrangements as may be required by the applicable U.S. Coast Guard, State, County, Municipal, or Port Authority codes, rules, regulations, and laws, and shall be responsible for compliance therewith, including storage of explosives.
- (9) All handling, use, and storage of explosives will be under the personal supervision of a Licensed Blaster.
- (10) No blasting is permitted when visibility is less than 1,500 feet in fog or rain, and between beginning of evening nautical twilight, and

ending of morning nautical twilight.

1.10 PROJECT/SITE CONDITIONS

1.10.1 EXISTING CONDITIONS

The rock to be removed is shown on the contract drawings and described in Section 02325 DREDGING, Subpart "Bedrock".

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Preblast Survey

The Contractor shall provide one person from his organization and his specialist on vibration control to work as a team with a representative of the Contracting Officer in making a preblast structural survey. A representative sample of structures (approximately 20 percent), as determined by the Contractor, that could receive seismic motion greater than 0.5 inch per second or airblast over pressure greater than 0.01 psi, will be inspected and their condition documented. Any existing outstanding architectural defects such as broken or fallen plaster or broken windows shall be photographically documented.

3.2 PREPARATION

3.2.1 Test Blast Program

A test blast program shall be conducted by the Contractor, consisting of at least six individual test blasts with a minimum of three test blasts in each work area. The purpose of the test program is to allow the Contractor to establish safe limits of vibration and airblast over-pressure. The test blast program shall be conducted and reported in strict accordance with procedures outlined in these specifications covering blasting methods and vibration control.

No test blasting shall be started until after the location for the individual test blasts has been reviewed and approved by the Contracting Officer.

The test event shall begin with a small number of charges and extend upward to the maximum yield to be used. The final test event shall simulate as close as practicable the explosive charge type, size, overlying water depth, charge configuration, charge separation, initiation methods, and emplacement conditions anticipated for the largest detonations. Upon any evidence of any damage to preblast survey structures, test blasting shall cease until the Contracting Officer has been notified and adjustments made.

One copy of the record for the test blasts shall be submitted in tabular form to the Contracting Officer.

After the series of test blasts, the Contractor shall examine the representative structures of the preblast survey as previously specified. All new damage resulting from the test blasting shall be reported in detail to the Contracting Officer, including photographs.

At the conclusion of the test blast program, the Contractor shall examine

all reports, surveys, test data, and other pertinent information: the conclusions reached shall be the basis for developing a completely engineered procedure for blasting. The procedures shall include sketches showing blasting patterns, weights and explosives, wiring, and charge emplacement. Four copies of the developed procedure shall be submitted for review to the Contracting Officer, and upon completion of the review and acceptance, it shall be appended to and become a part of the aforementioned blasting plan. A maximum period of seven days will be required for review and acceptance by the Contracting Officer of the proposed procedure. Such review period shall not be the basis for a claim against the Government for delay. In no event shall operational blasting proceed until the developed procedure for blasting has been reviewed and accepted by the Contracting Officer. If the procedure is not acceptable, the Contractor shall revise and resubmit the procedure. The Contracting Officer shall have five days for review and acceptance of the revised procedure.

3.3 BLASTING METHODS AND PROCEDURES

3.3.1 General

The Contractor shall take appropriate measures for controlling blast damage which shall include but are not limited to:

- (1) Choosing a suitable ignition pattern with millisecond delay detonators to minimize the instantaneous impulse.
- (2) Using lower charges in the first detonating delay than those in subsequent delays.
- (3) Taking precautions to avoid flashover, which shall include the following measures unless otherwise allowed by the Contracting Officer:
 - (a) Keeping the top of the hole uncharged for a depth equal to at least one-half the burden width.
 - (b) Using low sensitivity explosives in the entire pattern or loading the holes alternatively with high and low sensitivity explosives.
 - (c) Inspecting the ignition system using ground fault testing.

3.3.2 Blasting Control

3.3.2.1 Submittals

On a bi-weekly basis, the Contractor shall submit in tabular form a record for each blast which shall consist of positively identified, date and time and location of blast, amount of explosives used, peak particle velocity, and all other data necessary to adequately control blasting operations. A memorandum or telephone report on vibration intensity shall be submitted within 24 hours when specifically requested by the Contracting Officer or without request when such intensity exceeds a peak particle velocity of 1.5 inches per second.

3.3.2.2 Vibration Control

The vibration specialist shall adopt appropriate measures for blast damage reduction and shall be fully involved in a design of the test blasting and monitoring program and the final production blasting and monitoring

program. Monitoring stations shall be set up as necessary to gain reliable data on blast effects to structures deemed sensitive by the vibration specialist, Contractor, or Contracting Officer. Fourteen days shall be allowed for the Contracting Officer to review and accept the final blasting plan. The vibration specialist shall be retained throughout the operational program to provide and verify round-by-round blasting records.

Millisecond delay caps shall be used on all blasting work.

Blasting shall be controlled in such a manner that the maximum ground vibration level at any structure which is vulnerable to damage shall not exceed a zero-to-peak particle velocity of 2.0 inches per second nor an energy ratio of 1.0. The instrumentation shall record all three orthogonal components (vertical, radial, and transverse with respect to the location of the blast) of particle velocity direct (or shall have sufficient resolution of acceleration or displacement such that particle velocity can be readily and accurately determined from the records). The instantaneous vector sum of the three directional components of vibration will be used to compute the maximum vibration level.

-- End of Section --